

# IMPORTANT BIRD AND BIODIVERSITY AREAS IN INDIA

## Priority sites for Conservation

Revised and updated 2<sup>nd</sup> Edition Vol. II



# **IMPORTANT BIRD AND BIODIVERSITY AREAS IN INDIA**

## **Priority sites for conservation**

**Second Edition: Revised and Updated  
Volume II**

**Asad R. Rahmani, M. Zafar-ul Islam and Raju M. Kasambe**

**Maps prepared by**  
**Mohit Kalra and Noor I. Khan**

**Team Members**

**Noor I. Khan, Siddesh Surve, Abhijit Malekar and Nandkishor Dudhe**

### **Significant Contribution to this edition**

**Anwaruddin Choudhury, Arvind Mishra, Ajai Saxena, Dhananjai Mohan, Himmat Singh Pawar, Intesar Suhail, Khursheed Ahmad, Neeraj Srivastava, P.O. Nameer, Manoj Nair, Mrutyumjaya Rao, Praveen, J., Sanjeeva Pandey, S. Subramanya, Satya Prakash**

**Editors**  
**Gayatri Ugra and Maithreyi, M.R.**

**Layout and Design**  
**V. Gopi Naidu**

With major sponsorship from  
**Pavillion Foundation, Singapore**

**Recommended citation:**

Rahmani, A.R., Islam, M.Z. and Kasambe, R.M. (2016) Important Bird and Biodiversity Areas in India: Priority Sites for Conservation (Revised and updated). Bombay Natural History Society, Indian Bird Conservation Network, Royal Society for the Protection of Birds and BirdLife International (U.K.). Pp. 1992 + xii

© 2016 Authors.

Bombay Natural History Society,

Hornbill House, Shaheed Bhagat Singh Road, Mumbai-400001, INDIA.

Telephone: 0091-22-28429477 and 0091-22-22821811. Fax: 0091-22-22837615.

Email: info@bnhs.org; websites: [www.bnhs.org](http://www.bnhs.org) and [www.ibcn.in](http://www.ibcn.in)

Bombay Natural History Society in India is registered under Bombay Public Trust Act 1950: F244 (Bom) dated 06<sup>th</sup> July 1953.

**ISBN:** 978-93-84678-02-9

**Cover Photographs:** Design and collage by Gopi Naidu conceptualized by IBA Team.

First published: 2004 by IBCN: Bombay Natural History Society.

Second Revised Edition: 2016.

Printed by Akshata Arts Pvt Ltd. 22, A to Z Industrial Estate, G. Kadam Marg, Lower Parel, Mumbai 400 013. Published by the Bombay Natural History Society, Hornbill House, Shaheed Bhagat Singh Road, Mumbai 400 001.

**Designed:** V. Gopi Naidu.

Available from IBCN and BNHS website as given above.

**Declaration:**

This book is being uploaded on the IBCN website and the text can be used for educational purposes. The copyright of the photographs used in the book remains with the photographers as mentioned near each photograph and should not be used without their prior permission and consent.

**Donations to BNHS are exempt under 80G and 35(1)(ii) of Income Tax Act, 1961.**

The presentation of material in this book and geographical designations employed do not imply the expression of any opinion whatsoever on the part of IBCN and BNHS concerning the legal status of any state / country, territory or area, or concerning the delimitation of its frontiers or boundaries.

## MAHARASHTRA



ISAAC KEHIMKAR

A view of the northern part of the Western Ghats in Maharashtra

**M**aharashtra is the third largest state in India, with an area of 307,690 sq. km, constituting 9.36% of India's total geographical area. Situated at 15° 35' to 22° 02' N, and 72° 36' to 80° 54' E, the state is bounded by the Arabian Sea on the west, Gujarat on the northwest, Madhya Pradesh on the north, Chhattisgarh to the northeast, Andhra Pradesh to the east, and Karnataka and Goa to the south. The coastline is c. 720 km long. The Western Ghats (Sahyadris) run parallel to the sea coast. Physiographically, the state can be divided into five regions: the Deccan Plateau, Central Highlands (including the Satpuda Hill ranges along the northern border and the Bhamragad-Chiroli-Gaikhuri Ranges on the eastern border), Western Ghats or Sahyadris, and the Konkan or coastal plain. The Sahyadri Range, with an average elevation of 1,000 m, in some areas forms steep cliffs on the Konkan coast. Eastwards, the hill country falls in steps through a transitional area known as Malwa or Deccan Plateau to the plateau level.

Maharashtra is divided into 36 administrative districts. Nearly 60% of the human population depends on agriculture, from which 22% of the state's income is generated (Mathew 2003). Geographically, historically, and according to political sentiments, Maharashtra has five main regions:

(i) Vidarbha (Nagpur and Amravati divisions) (the Old Berar Region); (ii) Marathwada (Aurangabad Division); (iii) Khandesh and Northern Maharashtra Region (Nashik Division); (iv) Pune (Pune Division and West Maharashtra); and (v) the Konkan (Konkan Division).

The state has three well-defined seasons, monsoon, winter, and summer. The monsoon lasts from mid-June to the end of September, winter from October to January, and summer from February to May–June. The mean maximum temperature is 36.8 °C and the mean minimum temperature is 15.8 °C. Rainfall varies according to the topography of the region. The average annual rainfall in the Western Ghats is 2,000 mm, but in some areas it reaches up to 3,500 mm. Many districts like Nashik, Pune, Ahmednagar, Nandurbar, Jalgaon, Beed, Usmanabad, Parbhani, Akola, Satara, Sangli, Solapur, and some parts of Kolhapur lie in the rain shadow of the Ghats and have a mean annual rainfall of about 600 mm.

Maharashtra is the second most populous state of India, with about 9.29% (9.42% in 2001) of the country's population. The 2011 census records that there were 112.37 million (96.75 million in 2001) people living in the state, of which 45.23% (42.40% in 2001) were in urban areas and 54.77%

(67.60% in 2001) in rural areas. The density was 365 (314 in 2001) persons per sq. km. The literacy rate was 82.91% (77.27 % in 2001) (<http://www.census2011.co.in/census/state/maharashtra.html> accessed on March 22, 2013).

The livestock population in Maharashtra, according to the 18th Census in 2001 is 35.95 million (Forest Survey of India 2013).

## VEGETATION

According to the Forest Survey of India, Dehra Dun (2013), the forested area of Maharashtra has gone down from 6.38 million ha (in 2001) to 5.06 million ha, constituting 16.45% (from 20.75% in 2001) of its geographical area. Reserve forests constitute 76%, protected forests 14%, and unclassified forests 10%.

In the State of Forest Report (2001), six forest types are mentioned in Maharashtra: 1. Tropical Semi-evergreen, 2. Tropical Moist Deciduous, 3. Tropical Dry Deciduous, 4. Tropical Thorn, 5. Subtropical Broadleaf Hill, and 6. Littoral and Swamp Forests. Extensive tracts of forest are still present in the Vidarbha region and some patches in the northern Western Ghats. Some endemic and threatened plants are found in the evergreen and semi-evergreen patches of the Western Ghats.

Jagtap (1998) has mentioned about 8,952 species of plants including algae and fungi occurring in northern Western Ghats of Maharashtra. Pande (2005) has given a list of 2,123 plants including algae from various national parks and wildlife sanctuaries in Maharashtra.

## Faunal Diversity of Maharashtra

According to Mahabal & Sharma (2012), Maharashtra is home to 129 species of mammals, 556 species of birds, 117 species of reptiles, 53 species of amphibians, 215 species of freshwater fishes, and 653 species of marine and estuarine fishes. Mahabal & Sharma (2012) reported 5,640 species of invertebrates, including 160 species of molluscs, 162 species of marine bivalves, 450 species of marine gastropods, 37 species of prawns, 104 species of crabs, 213 species of lepidopterans (butterflies), and 34 species of scorpions.

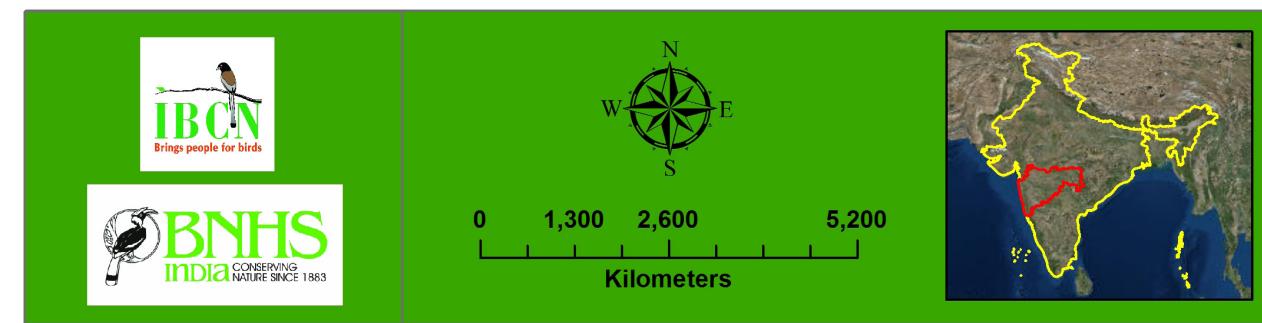
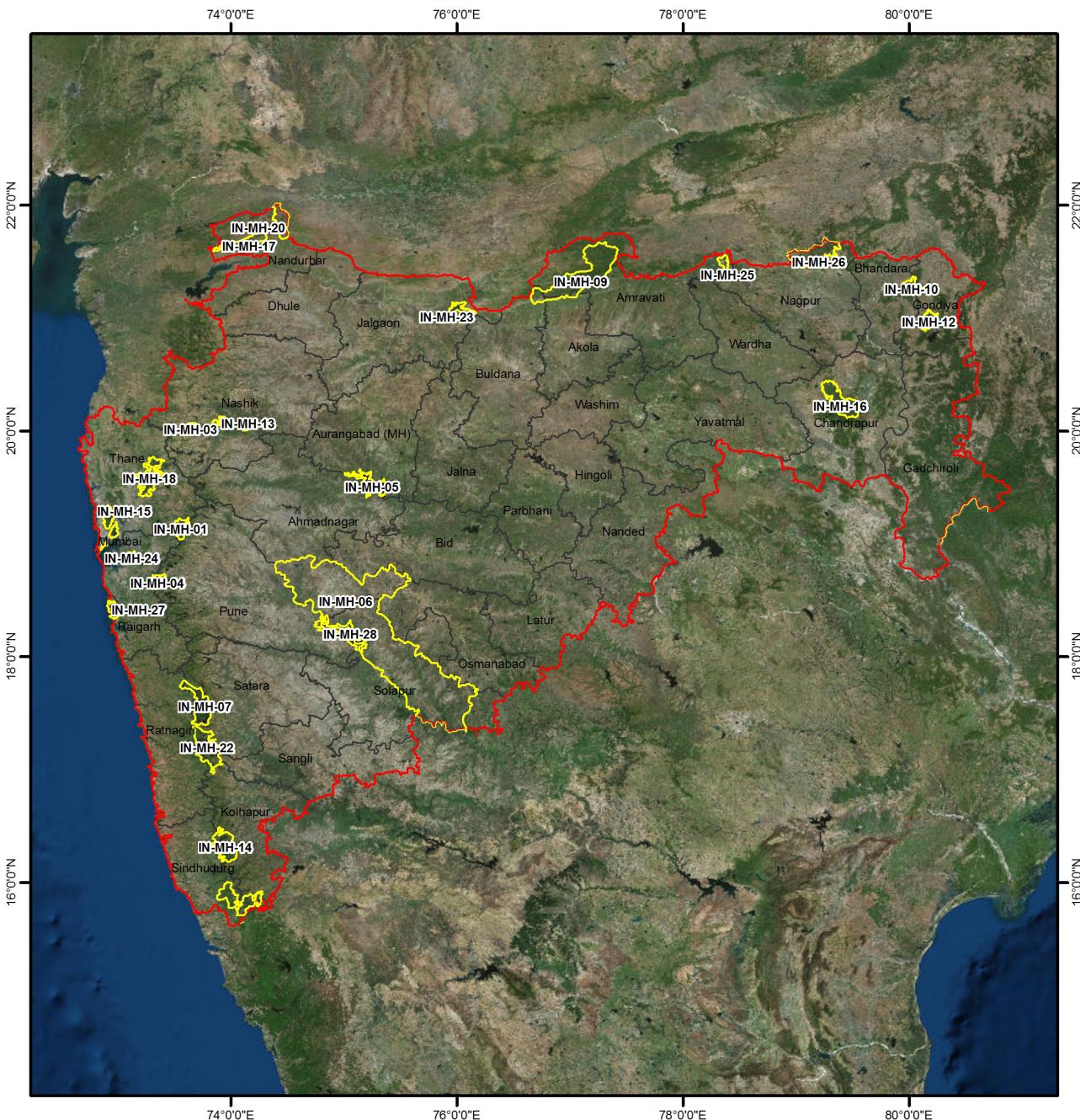
According to the last official record in the Gazetteer of India (1974), there are more than 600 species of fishes in Maharashtra, of which 414 are marine and 168 freshwater. Nearly 3,000 species of insects, 22 species of amphibians, 97 species of reptiles, and 85 species of mammals are also found here.

Among the mammals, *Myotis peshwa*, a highly endemic bat is found in the Pune and Mumbai regions. Recently,



Tropical Dry Deciduous habitat in Melghat Tiger Reserve

# Important Bird Areas in Maharashtra



IN-MH

**IBAs of MAHARASHTRA**

<b>IBA site codes</b>	<b>IBA site names</b>	<b>IBA criteria</b>
IN-MH-01	Bhimashankar Wildlife Sanctuary	A1, A2, A3
IN-MH-02	Burnt Island (Vengurla Rocks)	A4iii
IN-MH-03	Gangapur Dam and Grasslands	A1, A4i, A4iii
IN-MH-04	INS Shivaji and Adjoining Areas, Lonavala	A1, A2, A3
IN-MH-05	Jaikwadi Bird Sanctuary	A1, A4i, A4iii, A4iv
IN-MH-06	Great Indian Bustard Sanctuary (Nannaj and Other Grassland Plots)	A1
IN-MH-07	Koyna Wildlife Sanctuary	A1, A3
IN-MH-08	Mahul Sewree Mudflats	A1, A4i, A4iii
IN-MH-09	Melghat Tiger Reserve	A1, A2, A3
IN-MH-10	Nagzira Tiger Reserve	A1
IN-MH-11	Nandur Madhmeshwar Wildlife Sanctuary	A1, A4i, A4ii, A4iii
IN-MH-12	Navegaon National Park	A1, A3
IN-MH-13	Ozar, Wani, and Adjoining Grasslands	A1
IN-MH-14	Radhanagari Wildlife Sanctuary	A1, A2, A3
IN-MH-15	Sanjay Gandhi National Park-Tungareshwar Complex	A1, A2, A3
IN-MH-16	Tadoba-Andhari Tiger Reserve	A1, A3
IN-MH-17	Taloda Reserve Forest	A1, A2
IN-MH-18	Tansa Wildlife Sanctuary	A1, A3
IN-MH-19	Thane Creek	A1, A4i, A4iii
IN-MH-20	Toranmal Reserve Forest	A1, A2

**New IBAs of MAHARASHTRA**

<b>IBA site codes</b>	<b>IBA site names</b>	<b>IBA criteria</b>
IN-MH-21	Amboli-Tilari Reserve Forest	A1, A2, A3
IN-MH-22	Chandoli National Park	A1, A2
IN-MH-23	Hatnur Dam	A1, A4i, A4ii, A4iii
IN-MH-24	Karnala Bird Sanctuary	A1, A2
IN-MH-25	Mahendri Reserve Forest	A1, A2, A3
IN-MH-26	Pench Tiger Reserve	A1, A2, A3
IN-MH-27	Phansad Wildlife Sanctuary	A1, A2, A3
IN-MH-28	Ujjani Reservoir	A1, A4i, A4iii

A1 = Threatened species; A2 = Restricted-range species; A3 = Biome species;

A4 = Congregatory species

**LIST OF THREATENED BIRDS WITH IBA SITE CODES****CRITICALLY ENDANGERED**

Pink-headed Duck	<i>Rhodonessa caryophyllacea</i>	None at present
White-backed Vulture	<i>Gyps bengalensis</i>	IN-MH-01, 03, 04, 05, 07, 08, 09, 10, 11, 12, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27
Indian Vulture	<i>Gyps indicus</i>	IN-MH-01, 03, 04, 07, 08, 09, 11, 12, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27
Red-headed Vulture	<i>Sarcogyps calvus</i>	IN-MH-05, 06, 09, 12, 15, 16, 22, 25, 26
Siberian Crane	<i>Grus leucogeranus</i>	None at present
Great Indian Bustard	<i>Ardeotis nigriceps</i>	IN-MH-05, 06, 13
Jerdon's Courser	<i>Rhinoptilus bitorquatus</i>	None at present
Sociable Lapwing	<i>Vanellus gregarius</i>	None at present
Forest Owlet	<i>Heteroglaux blewitti</i>	IN-MH-09, 17, 18, 20, 25

ENDANGERED		
Greater Adjutant	<i>Leptoptilos dubius</i>	None at present
Egyptian Vulture	<i>Neophron percnopterus</i>	IN-MH-05, 06, 11, 12, 14, 16, 17, 20, 21, 24, 25, 26
Lesser Florican	<i>Sypheotides indicus</i>	IN-MH-03, 06, 13
Black-bellied Tern	<i>Sterna acuticauda</i>	IN-MH-10, 14, 21, 27
VULNERABLE		
Marbled Teal	<i>Marmaronetta angustirostris</i>	IN-MH-05
Asian Woollyneck	<i>Ciconia episcopus</i>	IN-MH-03, 04, 05, 06, 07, 09, 10, 11, 12, 14, 15, 16, 19, 22, 23, 25, 26, 28
Lesser Adjutant	<i>Leptoptilos javanicus</i>	IN-MH-10, 12, 15, 16
Lesser White-fronted Goose	<i>Anser erythropus</i>	IN-MH-03
Indian Spotted Eagle	<i>Clanga hastata</i>	IN-MH-05, 07, 14, 21
Greater Spotted Eagle	<i>Clanga clanga</i>	IN-MH-01, 05, 08, 10, 11, 12, 14, 15, 16, 17, 19, 20, 21, 26, 27, 28
Eastern Imperial Eagle	<i>Aquila heliaca</i>	IN-MH-03, 05, 08, 11, 12, 20
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>	IN-MH-15, 18
Sarus Crane	<i>Grus antigone</i>	IN-MH-12, 16
Great Knot	<i>Calidris tenuirostris</i>	IN-MH-27
Wood Snipe	<i>Gallinago nemoricola</i>	None at present
Indian Skimmer	<i>Rynchops albicollis</i>	IN-MH-15, 19
Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>	IN-MH-01, 04, 07, 14, 15, 21, 22, 27
Pale-capped Pigeon	<i>Columba punicea</i>	IN-MH-10
Bristled Grassbird	<i>Chaetornis striata</i>	IN-MH-14(?), 21
Indian Broad-tailed Grass-warbler	<i>Schoenicola platyura</i>	IN-MH-04, 14(?), 21
White-browed Bushchat	<i>Saxicola macrorhynchus</i>	None at present
Green Munia (Avadavat)	<i>Amandava formosa</i>	IN-MH-09, 10, 12, 16, 20
NEAR THREATENED		
Spot-billed Pelican	<i>Pelecanus philippensis</i>	IN-MH-27
Oriental Darter	<i>Anhinga melanogaster</i>	IN-MH-03, 04, 05, 10, 11, 12, 16, 18, 23, 25, 26, 28
Painted Stork	<i>Mycteria leucocephala</i>	IN-MH-04, 05, 06, 08, 09, 11, 16, 19, 23, 5, 28
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	IN-MH-05, 11, 12
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	IN-MH-04, 05, 06, 08, 11, 12, 16, 19, 20, 23, 25, 26, 27, 28
Lesser Flamingo	<i>Phoeniconaias minor</i>	IN-MH-05, 08, 11, 19, 28
Ferruginous Duck	<i>Aythya nyroca</i>	IN-MH-05, 11, 23, 26
Falcated Duck	<i>Anas falcata</i>	None at present
Lesser Fish-eagle	<i>Ichthyophaga humilis</i>	IN-MH-16
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaetus</i>	IN-MH-10, 12, 16, 26, 28
Cinereous Vulture	<i>Aegypius monachus</i>	IN-MH-09, 24
Pallid Harrier	<i>Circus macrourus</i>	IN-MH-01, 04, 05, 06, 11, 12, 20
Laggar Falcon	<i>Falco jugger</i>	IN-MH-06, 11, 12, 20
Great Thick-knee (Great Stone Plover)	<i>Esacus recurvirostris</i>	IN-MH-03, 05, 06, 09, 11, 19, 23, 25
River Lapwing	<i>Vanellus duvaucelii</i>	IN-MH-09, 26
Eurasian Curlew	<i>Numenius arquata</i>	IN-MH-05, 08, 11, 12, 19, 27, 28
Black-tailed Godwit	<i>Limosa limosa</i>	IN-MH-03, 05, 08, 11, 12, 19, 20, 23, 27, 28
River Tern	<i>Sterna aurantia</i>	IN-MH-02, 03, 04, 05, 06, 07, 08, 10, 11, 12, 14, 19, 20, 21, 22, 23, 25, 26, 28
Alexandrine Parakeet	<i>Psittacula eupatria</i>	IN-MH-03, 04, 05, 07, 09, 10, 11, 12, 14, 15, 16, 19, 22, 23, 24, 25
Red-breasted Parakeet*	<i>Psittacula alexandri</i>	IN-MH-15 (escaped birds)
European Roller	<i>Coracias garrulus</i>	IN-MH-06, 10, 11, 20
Great Pied Hornbill	<i>Buceros bicornis</i>	IN-MH-07, 14, 21
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>	IN-MH-04, 07, 09, 10, 12, 14, 15, 16, 18, 21, 26, 27
Tytler's Leaf-warbler	<i>Phylloscopus tytleri</i>	IN-MH-01

\*Red-breasted Parakeet is mainly found in north and north-east. Earlier it was heavily traded and sold in Mumbai market. Some birds were released by pet owners so a small population of this alien species is found around Mumbai



VISHWATEJ PAWAR

Endangered Black-bellied Tern *Sterna acuticauda* breeds in Maharashtra in small numbers

there have been some new additions to the list of mammals. Caracal *Caracal caracal* have been reported in the Melghat Tiger Reserve (Thosre 2014) and in Navegaon National Park (Bhimsen Patil Dongarwar, *pers. comm.* 2012). Indian Elephant *Elephas maximus* have moved to Sawantwadi and adjoining areas in the Sindhudurg district. Kondana Soft-furred Rat *Millardia kondana*, a Critically Endangered species of rodent is endemic to few hills of western Maharashtra (Sameer Bajaru, *pers. comm.* 2014).

Indian Egg-eater *Elachistodon westermanni* which is protected under Schedule I of the Indian Wildlife (Protection) Act, 1972 has been reported from Wardha, Akola, Amravati, and the buffer zone of Tadoba-Andhari Tiger Reserve in Chandrapur district (Srinivasulu *et al.* 2013).

At least two herds of wild Water Buffalo *Bubalus arnee* were sighted between January to May 2015 in the Kolamarka area of Aheri tehsil in Gadchiroli district. Forested area around Kolamarka was declared a Conservation Reserve about two years ago. (<http://indianexpress.com/article/india/india-others/wild-water-buffalo-herd-in-gadchiroli-triggers-hopes/#sthash.9mTkcQTF.dpuf> as accessed on July 15, 2015).

#### **IBAs and Protected Areas**

Presently, there are six national parks, 41 wildlife sanctuaries, and one conservation reserve in the state, covering an area of 8,994.95 sq. km (2.92%) of the state. Thus, the protected area has decreased from 4.68% in 2000 (Rodgers *et al.* 2000) to 2.92% after the rationalization of

the Great Indian Bustard Sanctuary in 2011 by the Forest Department. There are six tiger reserves, namely Sahyadri, Melghat, Pench, Tadoba-Andhari, and Bor Tiger Reserve (recently upgraded from a WLS), and the recently declared Umred-Karandla. The six national parks are Sanjay Gandhi, Gugamal, Navegaon, Pench, Chandoli, and Tadoba.

A total of 28 sites have been identified as Important Bird Areas (IBAs), of which seven are wildlife sanctuaries, two national parks, three are tiger reserves, and eight are non-protected areas. The total area of the IBAs in the state was 1,286,581 ha (Islam and Rahmani 2004). After the rationalization of the Great Indian Bustard Sanctuary (IN-MH-06) twice, the total area of the IBAs in Maharashtra has been reduced to 624,465 ha, as 812,978 ha was denotified and 150,862 ha area of the eight new IBAs was added. An additional eight IBAs are described in this book, of which four are non-protected areas and among the remaining four, two are wildlife sanctuaries and one each is a national park and a tiger reserve. The total area of the eight new IBAs is 150,862 ha.

#### **Avifauna**

Abdulali (1981) listed 540 species of birds from Maharashtra. More recently, a few more species have been added to the list, such as the Forest Owlet *Heteroglaux blewitti* (King & Rasmussen 1998), Ortolan Bunting *Emberiza hortulana* near Nashik (Raha & Gudsoorkar 2002), White-bellied Blue Flycatcher *Cyornis pallipes* (K.B. Singh, *pers. comm.* 2003), and Broad-tailed Grass-warbler

SECONDARY AREA S075: CENTRAL INDIAN FORESTS		
Forest Owlet	<i>Heteroglaux blewitti</i>	IN-MH-09, 17, 18, 20
ENDEMIC BIRD AREA 123: WESTERN GHATS		
Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>	IN-MH-01, 04, 07, 14, 15, 21, 22, 24, 27
Grey-fronted Green-pigeon	<i>Treron affinis</i>	IN-MH-24, 27
Malabar Parakeet	<i>Psittacula columbooides</i>	IN-MH-01, 04, 07, 14, 21, 22, 24, 27
Malabar Grey Hornbill	<i>Ocypterus griseus</i>	IN-MH-01, 04, 07, 14, 21, 22, 24, 27
Grey-headed Bulbul	<i>Microtarsus priocephalus</i>	IN-MH-22
White-bellied Blue Flycatcher	<i>Cyornis pallipes</i>	IN-MH-01, 04, 14, 22, 27
Indian Rufous Babbler	<i>Turdoides subrufus</i>	IN-MH-04, 07, 09, 14, 21, 22, 27
Nilgiri Flowerpecker	<i>Dicaeum concolor</i>	IN-MH-27
Malabar Lark	<i>Galerida malabarica</i>	IN-MH-22, 24, 27
Malabar Woodshrike	<i>Tephrodornis sylvicola</i>	IN-MH-27
Indian Broad-tailed Grass-warbler	<i>Schoenicola platyura</i>	IN-MH-04
Small Sunbird	<i>Nectarinia minima</i>	IN-MH-01, 04, 07, 14, 21, 22, 24, 27
Vigor's Sunbird	<i>Aethopyga vigorsii</i>	IN-MH-04, 22, 24, 27

*Schoenicola platyura* (Raha *et al.* 2004). The Speckled Piculet *Picumnus innominatus* and Malabar Trogon *Harpactes fasciatus* were also observed in the Maharashtra Western Ghats (P. Gole, *pers. comm.* 2002; G. Jathar, *pers. comm.* 2003). Prasad (2003) listed c. 450 bird species from western Maharashtra. Recently, a Blue-and-White Flycatcher *Cyanoptila cyanomelana* (Kawale 2012) and a Woodchat Shrike *Lanius senator* (Nandgaonkar 2013) were sighted near Alibag in Raigad district, these being the first records of the species in India. A single Red Phalarope *Phalaropus fulicaria* was seen at Wena lake in Nagpur district on May 1, 2013, which is the first record of the species in Peninsular India (Rawal *et al.* 2013).

There are old records of Jerdon's Courser *Rhinoptilus bitorquatus* from Sironcha area in Gadchiroli district, and of a straggler Siberian Crane *Leucogeranus leucogeranus* (=*Grus leucogeranus*) from Nagpur district (D'Abreu 1935). However, there are no recent records of these two species in Maharashtra. An attempt to rediscover Jerdon's Courser in Sironcha area was in vain (Kasambe *et al.* 2009) and further surveys are difficult due to insurgency problems in this area (Gopal Thosar, *pers. comm.* 2013).

### RESTRICTED-RANGE SPECIES AND ENDEMIC SPECIES

Parts of the Western Ghats in Maharashtra lie in Endemic Bird Area 123, in which Stattersfield *et al.* (1998) had identified 16 restricted-range species. With taxonomic changes and upgradation of many subspecies in to full species, now there are 26 endemic species in the Western Ghats (Rasmussen and Anderton 2005, 2012; del Hoyo and Collar 2014). Thirteen species have been recorded from Maharashtra. Nilgiri Wood-pigeon *Columba elphinstonii*, Grey-fronted Green-pigeon *Treron affinis*, Malabar (Blue-winged) Parakeet *Psittacula columbooides*, Malabar Grey

Hornbill *Ocypterus griseus*, Indian Rufous Babbler *Turdoides subrufus*, Grey-headed Bulbul *Pycnonotus priocephalus*, White-bellied Blue Flycatcher *Cyornis pallipes*, Broad-tailed Grassbird *Schoenicola platyura*, Nilgiri Flowerpecker *Dicaeum concolor*, Malabar Woodshrike *Tephrodornis sylvicola*, Malabar Lark *Galerida malabarica*, Vigor's Sunbird *Aethopyga vigorsii*, and Small (Crimson-backed) Sunbird *Nectarinia minima*. These restricted-range species are found mainly in Amboli-Tilari Reserve Forest, Chandoli National Park, Bhimashankar Wildlife Sanctuary, Radhanagari Wildlife Sanctuary, Karnala Bird Sanctuary, Koyna Wildlife Sanctuary, INS Shivaji and Lonavala, Phansad Wildlife Sanctuary and Sanjay Gandhi National Park.

Maharashtra also has a Secondary Area (s075: Central Indian Forests) with the presence of the Forest Owlet.

### BIOMES

Two biomes are found in Maharashtra, the Indian Peninsula Tropical Moist Forest (Biome 10) in the Western Ghats region, and Indo-Malayan Tropical Dry Zone (Biome 11) in the remainder of the state. Biome 10 represents the Western Ghats and covers parts of Kolhapur, Sindhudurg, Ratnagiri, Raigad, Thane, Pune, Satara, and Sangli districts. Of the 15 species found in Biome 10 (BirdLife International, undated), 11 species have been recorded in Maharashtra. The major habitat types in these biomes are Evergreen, Semi-evergreen, and Moist Deciduous. The IBAs are Koyna WLS, Radhanagari WLS, Sanjay Gandhi NP, Tansa WLS, Bhimashankar WLS, and INS Shivaji & Lonavala.

The sprawling Deccan Plateau, covering almost 80% of the state, qualifies as Biome 11. Toranmal Reserve Forest, Taloda RF, Melghat TR, Nagzira WLS, Tadoba-Andhari TR, and Navegaon NP are the IBAs under Biome 11. The Critically Endangered and endemic Forest Owlet *Heteroglaux blewitti* has been reported from Toranmal, Taloda, and the



Forest patch cleared for agriculture in Forest Owlet *Heteroglaux blewitti* habitat

Melghat region (Ishtiaq & Rahmani 2000, Jathar & Rahmani 2004, Kasambe *et al.* 2004). Vulnerable species such as the Green Munia *Amandava formosa*, Greater Spotted Eagle *Clanga clanga*, and Eastern Imperial Eagle *Aquila heliaca* are found here. The major habitat types in this biome are Tropical Dry Deciduous Forest, Tropical Thorn Forest, and Grassland. Nannaj plots, Ozar grassland, and Gangapur grassland bear Tropical Thorn Forest and Grassland. These areas provide refuge to the Critically Endangered Great Indian Bustard *Ardeotis nigriceps* and the Endangered Lesser Florican *Syphocetes indicus*.

#### CONGREGATIONS

Thane Creek, Mahul Sewree Mudflats, Jaikwadi WLS, Nandur Madhmeshwar WLS, Navegaon NP, Gangapur Dam, Hatnur Dam, Ujjani Reservoir, and Burnt Island (Vengurla Rocks) qualify for A4 (congregation) criteria. Thane Creek and the Mahul Sewree Mudflats are famous for large congregations of waders and flamingos. Gangapur Dam came into prominence when the Lesser White-fronted Goose *Anser erythropus* was seen there. Jaikwadi WLS, Nandur Madhmeshwar WLS, and Navegaon NP are famous for huge congregations of waterfowl. Burnt Island (Vengurla Rocks) is an IBA because thousands of seabirds breed there. Besides, a huge breeding colony of the Indian Swiftlet *Collocalia unicolor* resides in the caves on that island.

#### THREATENED BIRD SPECIES FOR WHICH

#### MAHARASHTRA IS IMPORTANT

##### **Forest Owlet *Heteroglaux blewitti*, Critically Endangered**

The Forest Owlet was rediscovered in 1997 by a team from the Smithsonian Institution (King & Rasmussen 1998). Later, BNHS began a detailed study of the bird (Ishtiaq 1999, 2000; Ishtiaq & Rahmani 2000). It has a fragmented population in the Central Indian forests, and is graded as Critically Endangered. It has been reported from Toranmal RF, Taloda RF, Melghat TR, and Mahendri RF in Maharashtra (Ishtiaq & Rahmani 2000, Jathar & Rahmani 2004). Melghat has a sizeable population of Forest Owlet and is better protected than other sites (Kasambe *et al.* 2005). The Forest Owlet has been sighted in Narnala Wildlife Sanctuary (Chavan *et al.* 2013). Recently it has been reported from Tansa Wildlife Sanctuary (Laad and Dagale 2014).

##### **Great Indian Bustard *Ardeotis nigriceps*, Critically Endangered**

This bustard has a very small, declining population because of habitat degradation and agricultural development. In Maharashtra, it was often seen in large numbers, especially in Nannaj (Great Indian Bustard Sanctuary). Sometimes up to 30 bustards were seen in Nannaj, but recent



ALKESH THAKARE

Livestock grazing is a problem in many IBAs in Maharashtra

sightings show that the population collapsed, as only three birds were seen in 2013 (Kasambe & Surve 2013). Ozar is another site where the bustard was reported but is not seen anymore (B. Raha, *pers. comm.* 2012). A few bustards are regularly sighted near Warora and one or two near Nagpur city in Vidarbha (Kasambe *et al.* 2007, Thosar *et al.* 2007). An occasional bird is seen Ahmednagar district.

#### **Lesser Florican *Sypheotides indicus* Endangered**

This species is Endangered and has a small, declining population, primarily as a result of the loss and degradation of its grassland habitat. In Maharashtra, it has been reported from Ozar and adjoining grasslands, and from the Gangapur grasslands. It is occasionally seen in the Nannaj grasslands in Solapur district. The extant grasslands of Maharashtra may be important as a refuge for this species during the non-breeding season. It has been sighted near Yavatmal, Akola, Nashik, Kolhapur, and Solapur (Kasambe & Gahale 2010).

Kaustubh Pandharipande has claimed that there are 20-25 Lesser Floricans in Washim district. An area of 800 sq. km is demarcated as active Lesser Florican habitat in the Vidarbha region. Floricans are sighted in grassland-agriculture landscape in Akola and Washim districts. He is working with the Phasepardhi community to locate florican

and for the conservation of florican and its habitat through the community involvement (Rahmani *et al.* 2014).

#### **Nilgiri Wood-pigeon *Columba elphinstonii*, Vulnerable**

The widespread destruction of its forest habitat has led to a decline in the population of this wood-pigeon. Vulnerable according to the IUCN Red List, it is also one of the 26 endemic birds of the Western Ghats, and occurs in evergreen biotope. It is seen from Anamalai to Mumbai in the Western Ghats. In Maharashtra, it has been recorded from Bhimashankar, Radhanagari, and Koyna WLSs, and up to Mumbai, and was reported in Sanjay Gandhi National Park in Mumbai in November 1973 (Daniel & Amladi 1974). It is an uncommon, rare resident in Phansad WLS, Raigad district, where it is mostly seen in Chikhalgan, Phansadgan, and Savratgan areas of the sanctuary (Nikhil Bhopale, *pers. comm.* 2012). Two birds were also seen at Matheran on March 24, 2012 by one of the authors (Raju Kasambe).

#### **Indian Broad-tailed Grass-warbler *Schoenicola platyura*, Vulnerable**

This bird is restricted to grassy highlands, mainly in the Western Ghats, at least in the breeding season. Degradation and modification of its grassy highlands range has caused



SANJAY KAKKARE

There is tremendous increase in tourism pressure on IBAs, particularly in Tiger Reserve like Tadoba in Maharashtra

great fragmentation of its population (BirdLife International 2001). This Vulnerable species was found in the Khandala area (K.B. Singh, *pers. comm.* 2003) and is reported to breed in Ramshej Ghats (10 km from Gangapur grasslands and 18 km from Nashik) at 900 msl (B. Raha, *pers. comm.* 2012).

#### Restricted-Range species

##### Malabar or Blue-winged Parakeet

*Psittacula columbooides*

Restricted to the Western Ghats, this parakeet is categorized as Vulnerable (BirdLife International 2001). It

has been reported from Bhimashankar Wildlife Sanctuary and in INS Shivaji and adjoining areas of Lonavala. There are possibilities of its occurrence in a stretch of the northern Western Ghats, in areas like Radhanagari WLS, Chandoli WLS, and parts of Ratnagiri and Sindhudurg districts.

##### Malabar Grey Hornbill *Ocyceros griseus*

Common in the Konkan area of Maharashtra, this hornbill is found especially in Sindhudurg and Ratnagiri districts. However, it has only been reported from three

There are no recent records of three Critically Endangered species of birds which were historically reported in Maharashtra on a few occasions. Presumably these three are extinct from the state: Jerdon's Courser *Rhinoptilus bitorquatus*, Pink-headed Duck *Rhodonessa caryophyllacea* (no recent records anywhere in the world), and Siberian Crane *Grus leucogeranus* (no recent records in India).

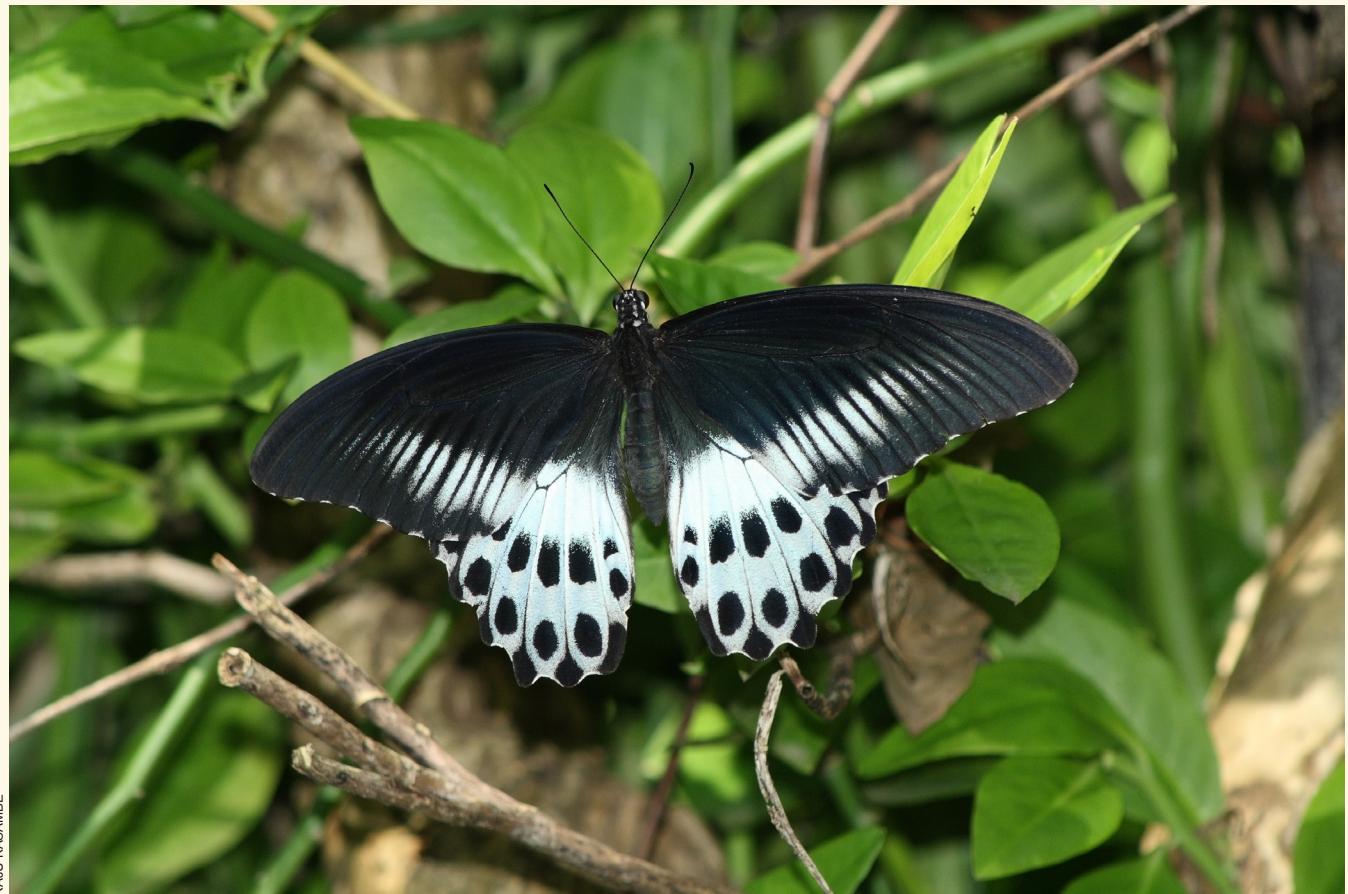
Some threatened species, reported on few occasions in Maharashtra, are not recorded in any of the present IBAs. These include Sociable Lapwing *Vanellus gregarius* (CR, not found in any IBA), Greater Adjutant *Leptoptilos dubius* (EN, no recent records), Marbled Duck *Marmaronetta angustirostris* (VU, no recent records), Wood Snipe *Gallinago nemoricola* (VU, no recent records), White-browed Bushchat *Saxicola*

*macrorhynchos* (VU, not found in any IBA) and Falcated Duck *Anas falcata* (NT, not found in any IBA).

Great Thick-knee (Great Stone Plover) *Esacus recurvirostris* and Alexandrine Parakeet *Psittacula eupatria* have recently been added to the IUCN list of Near Threatened species.

A small population of Red-breasted Parakeet *Psittacula alexandri*, possibly escapees or released, is found in Mumbai city and at least three birds are seen along the fringe of SGNP (Kasambe 2014).

Indian Rufous Babbler *Turdoides subrufus* and White-bellied Blue Flycatcher *Cyornis pallipes*, two interesting species, have been reported only from the INS Shivaji area and are not found anywhere else in the northern Western Ghats.



RAJU KASAMBE

Recently the Government of Maharashtra declared Blue Mormon *Papilio polymnoster* as the 'State Butterfly'

IBAs, namely Bhimashankar WLS, INS Shivaji (in the Lonavala area), and Radhanagari WLS.

#### **Small (Crimson-backed) Sunbird *Nectarinia minima***

This endemic sunbird has been recorded from Bhimashankar WLS, INS Shivaji & Lonavala, Radhanagari WLS, Koyna WLS and Amboli-Tilari Reserve Forest. It has also been reported from the Semi-evergreen forests of Ratnagiri and Sindhudurg districts.

#### **THREATS AND CONSERVATION ISSUES**

##### **Ramsar Status to IBAs and other wetlands**

In 2013, the Forest Department announced that six sites were identified to be declared as Ramsar Sites in Maharashtra. These are Sewri Creek (Mumbai district), Ujjani Reservoir (Pune district), Jaikwadi Bird Sanctuary (Aurangabad district), Navegaon Bandh Reservoir (Gondia district), Nandur Madhmeshwar Wildlife Sanctuary (Nashik district), and Lonar Crater Wildlife Sanctuary (Buldhana district) (<http://www.downtoearth.org.in/news/maharashtra-to-propose-five-wetland-sites-for-recognition-as-ramsar-sites-40159> as accessed on 05 September 2015). However, no site has got Ramsar status till date. All these sites, except the Lonar Crater Wildlife Sanctuary and Navegaon Bandh Reservoir were proposed as potential Ramsar Sites by Islam

and Rahmani (2008). Additionally, Thane Creek was also proposed as a potential Ramsar Site in the above book.

##### **Thane Creek Flamingo Sanctuary**

The Forest Department, Government of Maharashtra, declared an area of 1,691 hectares (16.9 sq km) as Thane Creek Flamingo Sanctuary on August 6, 2015. It includes 896 ha mangrove cover along the western side of the creek (in Mulund, Vikhroli, Bhandup, KanjurMarg and Mandala areas plus 795 ha of creek area which is partly exposed during low tide. This is the area used by thousands of flamingos for resting during high tide.

##### **Human Dam**

Unplanned water management has led to the creation of large dams at the expense of habitat destruction and fragmentation. For example, Human Dam is a major irrigation project to be built across Human river in the Wainganga-Godavari basin near village Sirkada in Sindewahi tehsil of Chandrapur district. The Human is a tributary of the Andhari river, which ultimately joins the Wainganga. The proposed project aims to divert 132 million cu. m water to the Maharashtra State Electricity Board's Chandrapur Thermal Power Station. The project also involves forest clearance and diversion of 2,906 ha

land.

The Human Project will result in the submergence of the only effective wildlife corridor connecting Chandrapur Division with Brahmapuri Division. It will also submerge villages such as Palasgaon, Pipara-Perna, Sirkada (south of Palasgaon), Vihirgaon, Manemohadik, Khambada, Gondeda, Kewada, and Pendhri (north of Palasgaon), that lie in and around the narrow corridor connecting Chandrapur and Brahmapuri Forest Divisions.

### Mumbai Trans Harbour Link

The Government of Maharashtra has proposed the construction of Mumbai Trans Harbour Link (MTHL) through the Sewri Mudflats which will connect mainland Mumbai to Nhava Sheva. But the bridge will eventually destroy the mudflats as it will pass right through them. BNHS proposed realigning the bridge to save the IBA (Kasambe 2011). In a letter to MMRDA on November 10, 2012, BNHS advised MMRDA to shift the starting point of the MTHL c. 700 m south of its current position. If this is done, it will achieve the goal of saving the mangroves, with conservation and development going together. The birds and the bridge can coexist if given a chance. MMRDA officials, however, seem unwilling to relent. They have refused to realign the link, citing technical reasons. While responding to BNHS's letter in a reply dated November 28, 2012, MMRDA did not mention the realignment of the bridge (Aghor 2012).

### Status of Great Indian Bustard Sanctuary, Nannaj

The population of the Great Indian Bustard (GIB) recently crashed from 27 birds in 2006 to 12 birds in 2012 in the Great Indian Bustard Sanctuary, Nannaj (Kasambe & Surve 2013). During the monsoon of 2013, only three bustards were sighted in the sanctuary area. As per the recommendations of the Sawarkar Committee constituted by the Government of Maharashtra in 2007, the sanctuary area was rationalized, and reduced to 1,222.61 sq. km in 2012. It was again reduced to a mere 366.66 sq. km by the Forest Department in 2014.

The biggest threat to the sanctuary is the severe antipathy of the locals towards the sanctuary and the GIB. This was mainly because the sanctuary covered an extremely large, irrational area which included villages and other human habitations. Because of the declaration of the sanctuary, the locals were unable to buy, sell, or develop their own land as it came within the notified area. A proposed irrigation canal passing through the sanctuary awaits the approval of the Ministry of Environment and Forests (MoEF) for the past several years. The people who would have benefited from the canal feel that the bustard "is the problem" and stands between them and prosperity. The impasse over the construction of the canal created a public uproar, and a

campaign was initiated against the bustard, which strangely and ominously coincided with a population decline in the species. The sanctuary area has been rationalized many years after the recommendations of an expert committee (Kasambe & Surve 2013). It is probably too late to undo the damage to the bustard population.

### Encroachments

With the increasing human population, encroachment on forest land is common in India, and Maharashtra is no different. This has resulted in massive degradation of forests and illegal exploitation of resources. For example, the Yawal Wildlife Sanctuary in Jalgaon, situated on the western side of the Satpuras bordering Madhya Pradesh, is under heavy pressure from encroachers. Yawal Sanctuary is important because it is part of the Satpura Tiger landscape. It has a close link with Aner Sanctuary, Dhulia district to the west, and Ambabarawa Sanctuary to the east, while further east are Van and Narnala Sanctuaries, and Melghat Tiger Reserve.

After the enactment of The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (also called the Forest Rights Act), encroachments have increased tremendously in some IBAs including Toranmal and Taloda, and in Yawal Wildlife Sanctuary, all of which are important habitats of the Critically Endangered Forest Owlet. About 29% of the vegetation has disappeared since 2001. This will have a severe negative impact on the flora and fauna of these areas. It is strongly recommended that any further deforestation in the name of the Forest Rights Act should be stopped. Toranmal, which is the habitat of the Forest Owlet, should be declared as a Community Reserve, involving local people in the protection of the species. Effective environmental awareness programmes should be started amongst the tribals to wean them away from killing this highly threatened species.

**Mining:** Overexploitation of minerals, oil, and stone quarrying have depleted most of the resources in the non-protected areas of India. Mining industries have expanded to the extent of approaching protected areas (PAs), and some are even located inside PAs. Unplanned mining activities at the cost of the environment are proving to be detrimental to our last remaining wildlife habitats. Though small-scale quarrying is done all along Maharashtra's Western Ghats, the main areas of conflict are the bauxite-rich plateaus in southern Maharashtra. Bauxite leases and mines pockmark this portion of the Ghats. Undoubtedly the most controversial has been the mining in and around Radhanagari WLS. Indian Aluminium's (INDAL) Durgamanwad mine touches the northern boundary of Radhanagari. Though the lease was granted before the notification of the sanctuary, operations commenced only in 1993. Surprisingly, environmental

clearance was granted even though the mine actually touches the sanctuary border.

On the positive side, in 2012, the State Government increased the area under the Nagzira Wildlife Sanctuary in Bhandara district, Navegaon National Park in Gondia district, and Bor Wildlife Sanctuary in Wardha district for the conservation and protection of wildlife. Both Nagzira and Navegaon have also been proposed as tiger reserves. The government has issued a notification adding 152 sq. km to Nagzira, 122 sq. km to Navegaon and 60 sq. km to Bor. The total protected area in Nagzira Wildlife Sanctuary and Navegaon National Park has increased from 285 sq. km to 559 sq. km. These two PAs are close to each other and are also linked by the Pench-Tadoba corridor.

## REFERENCES

Abdulali, H. (1981) *Checklist of the birds of Maharashtra with notes on their status around Bombay*, 2nd edn. Bombay Natural History Society, Bombay.

Aghor, A. (2012) <http://www.downtoearth.org.in/content/shift-mumbai-trans-harbour-link-alignment-demand-environmentalists>. Accessed on January 30, 2013.

BirdLife International (2001) *Threatened Birds of Asia: The BirdLife International Red Data Book*. BirdLife International, Cambridge, UK.

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, UK. Unpubl.

Chavan, R., Pariwakam, M. and Bansod, V. (2013) Occurrence of the Forest Owlet *Heteroglaux blewitti* in Narnala Wildlife Sanctuary, Maharashtra. *Care 4 Nature* 1(1): 33–35.

D'Abreu, E.A. (1935) A list of the birds of Central Provinces. *JBNHS* 38: 95–116.

Daniel, J.C. and Amladi, S.R. (1974) The Nilgiri Wood Pigeon *Columba elphinstonii* (Sykes) on Salsette Island, Bombay. *JBNHS* 71(2): 304.

del Hoyo, J. and Collar, N.J. (2014) *HBW and BirdLife International Illustrated Checklist of the Birds of the World*. Volume 1: Non-passerines. Lynx Edicions, Barcelona

Forest Survey of India (2001) *State of Forest Report 2001*. Ministry of Environment and Forests, Govt. of India, Dehra Dun. Pp.130.

Forest Survey of India (2013) *India State of Forest Report 2013*. Ministry of Environment and Forests, Govt. of India, Dehra Dun. Pp. 282.

Gazetteer of India (1974) Maharashtra State Gazetteers, General Series-Fauna. Government Printing Press, Maharashtra State, Nagpur. Pp.711.

Ishtiaq, F. (1999) Forest Owlet – an update. *Hornbill* Jun–Sept: 26–28.

Ishtiaq, F. (2000) Red Data Bird: Forest Spotted Owl. *Newsletter for Birdwatchers* 40(3): 29–31.

Ishtiaq, F. and A.R. Rahmani (2000) Further information on status and distribution of Forest Owlet (*Athene blewitti*). *Forktail* 16: 125–130.

Islam, Z.A. and Rahmani, A.R. (2004) *Important Bird Areas in India: Priority Sites for Conservation*. Indian Bird Conservation Network, Bombay Natural History Society and BirdLife International (UK). Pp xviii + 1133.

Islam, M.Z. and Rahmani, A.R. (2008) *Potential and Existing Ramsar Sites in India*. Indian Bird Conservation Network, BNHS, BirdLife International and Royal Society for the Protection of Birds. Oxford University Press. Pp. 592.

Jagtap, A.P. (1998) *Biodiversity of the Western Ghats of Maharashtra*. WWF for Nature India, BHPC, Pune.

Jathar, G. and A.R. Rahmani (2004) Ecological studies of the Forest Spotted Owl *Athene (Heteroglaux) blewitti*. Final report. BNHS. 77 pp.

Kasambe, R. (2011) Meeting for deliberations on Trans-Harbour Link, Mumbai. *Mistnet* 12(4): 13.

Kasambe, R. (2014) Updates in the IUCN Red List of Threatened Birds of India. *Mistnet* 15(1): 17–18.

Kasambe, R. and Gahale, P. (2010) Status survey and sighting records of Lesser Florican in Maharashtra. *Mistnet* 11(2): 7–9.

Kasambe, R. and Surve, S. (2013) IBAs in Danger. *Hornbill* Oct-Dec: 41–46.

Kasambe, R., Pande, S., Wadatkar, J., and Pawashe, A. (2004) Additional Records of the Forest Owl *Heteroglaux blewitti* Hume, 1873, in Melghat Tiger Reserve, Maharashtra. *Newsletter for Ornithologists* 1(1–2): 12–14.

Kasambe, R., Wadatkar, J., Bhusum, N.S., and Kasdekar, F. (2005) Forest Owlets *Heteroglaux blewitti* in Melghat Tiger Reserve, Distt. Amravati, Maharashtra. *Newsletter for Birdwatchers* 45(3): 38–40.

Kasambe, R., Pimplapure, A., Thosar, G., and Shad, M.S.R. (2007) Sighting records of Great Indian Bustards *Ardeotis nigriceps* in Vidarbha. *Newsletter for Birdwatchers* 46(6): 88–89.

Kasambe, R., Pimplapure, A. and Thosar, G. (2009) Status survey of Jerdon's Courser *Rhinoptilus bitorquatus* in Vidarbha, Maharashtra. *Mistnet* 10(1): 4–6.

Kawale, P. (2012) First record of the Blue-and-White Flycatcher *Cynoptila cyanomelana* in India. *JBNHS* 110(1): 8.

King, B.F. and P.C. Rasmussen (1998) The rediscovery of the Forest Owl *Athene (Heteroglaux) blewitti*. *Forktail* 14: 53–55.

Laad, S. and Dagale, R. (2014) First report of Forest Owl *Heteroglaux blewitti* from Tansa Wildlife Sanctuary (Western Ghats), Maharashtra, India. *JBNHS* 111(2): 134.

Mahabal, A. and Sharma, R.M. (2012) An overview. In Editor-Director (2012) *Fauna of Maharashtra. Part-1 Vertebrates*. State Fauna Series 20, Zoological Survey of India, Kolkata. Pp. 1–19.

Mathew, K.M. (2003) *Manorama Yearbook 2003*. Malayala Manorama, Kottayam. Pp. 834.

Pande, P. (2005) *National parks and sanctuaries in Maharashtra: A reference guide*. Bombay Natural History Society, Mumbai.

Prasad, A. (2003) Annotated Checklist of the Birds of Western Maharashtra. *Buceros* 8(2&3): 174.

Nandgaonkar, P.S. (2013) Woodchat Shrike *Lanius senator* from Alibaug, Maharashtra: A first record for India. *Indian Birds* 8(6): 164.

Raha, B. and S.R. Gudsoorkar (2002) Sighting of Ortolan Bunting *Emberiza hortulana* at the grassland around Gangapur, Nashik. *JBNHS* 99(3): 536.

Raha, B., Bhure, N., and Ugaonkar, D. (2004) Birds of Nashik. Nature Conservation Society of Nashik. Pp. 1–24.

Rahmani, A.R., Kasambe, R., Narwade, S., Patil, P., and Khan, N.I. (2014) *Threatened Birds of Maharashtra*. Indian Bird Conservation Network, Bombay Natural History Society, Royal

Society for the Protection of Birds, and BirdLife International. Oxford University Press. Pp. xii + 224.

Rasmussen, P.C. and Anderton, J.C. (2005) *Birds of South Asia: the Ripley guide*. Vols 1 & 2. Smithsonian Institution and Lynx Edicions, Washington, D.C. and Barcelona.

Rasmussen, P.C. and Anderton, J.C. (2012) *Birds of South Asia: The Ripley Guide*. Vols 1 & 2. 2nd edn. National Museum of Natural History, Smithsonian Institution, Michigan State University, & Lynx Edicions, Washington, D.C., Michigan & Barcelona.

Rawal, T.S., Kumar, H. and Shukla, K. (2013) Red Phalarope *Phalaropus fulicaria*: an addition to the avifauna of peninsular India. *Indian BIRDS*. 8: (4) 103–104.

Rodgers, W.A., Panwar, H.S., and Mathur, V.B. (2000) *Wildlife Protected Area Network in India: A Review (Executive Summary)*. Wildlife Institute of India, Dehradun. Pp. 44.

Srinivasulu, C., Srinivasulu, B., Vyas, R., Thakur, S., Mohapatra, P., and Giri, V. (2013) *Elachistodon westermanni*. In: IUCN 2014. IUCN Red List of Threatened Species. Version 2014.1. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Downloaded on 02 July 2014.

State of Forest Report 2003, Forest Survey of India, Ministry of Environment and Forests, Dehra Dun, <http://sdnp.delhi.nic.in/resources/forest/forest-frame.html>

Stattersfield, A.J., Crosby, M.J., Long, A.J., and Wege, D.C. (1998) *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. BirdLife Conservation Series No. 7. BirdLife International, Cambridge, UK.

Thosar, G., Ladkhedkar, R., Pimplapure, A., and Kasambe, R. (2007) Status and conservation of Great Indian Bustard *Ardeotis nigriceps* in Vidarbha. *Mistnet* 8(3): 10–11.

Thosre, P. (2014) *The wild mammals of Maharashtra*. Published by Mrs. Deepti Thosre. Pp. 100.

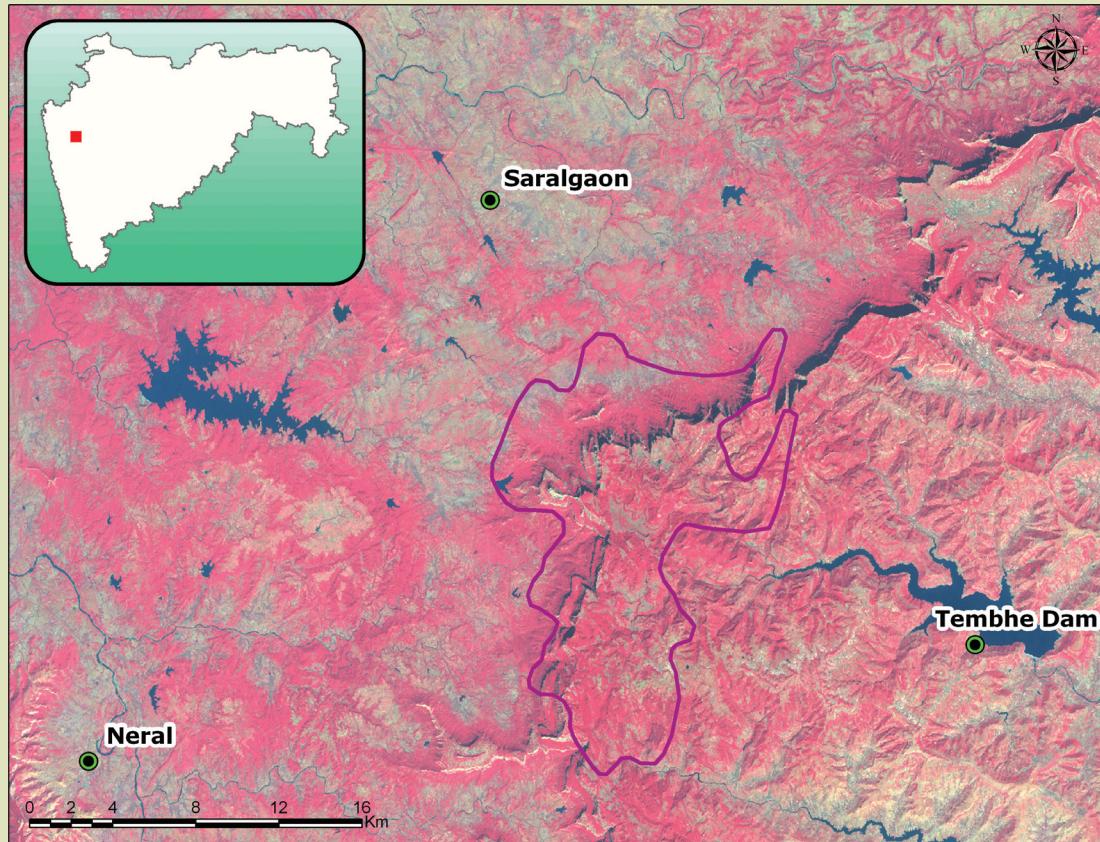
## BHIMASHANKAR WILDLIFE SANCTUARY

<b>IBA Site Code</b>	: IN-MH-01
<b>District</b>	: Pune, Raigad, Thane
<b>Coordinates</b>	: 19° 14' 28" N, 73° 35' 09" E
<b>Ownership</b>	: State, Private
<b>Area</b>	: 13,078 ha

<b>Altitude</b>	: 650–1,140 msl
<b>Rainfall</b>	: 3,000 mm
<b>Temperature</b>	: 7 °C to 36 °C
<b>Biogeographic Zone</b>	: Western Ghats
<b>Habitats</b>	: Tropical Semi-evergreen Forest, Tropical Moist Deciduous Forest

**IBA CRITERIA:** A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats),  
A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

**PROTECTION STATUS:** Wildlife Sanctuary, established 1985.



### GENERAL DESCRIPTION

Bhimashankar Wildlife Sanctuary lies in the northern part of the Western Ghats in Maharashtra. It is situated at the crest of the main Sahyadri range and includes spurs running gradually into the eastern plains, as well as steep terraced western slopes leading to the Konkan region. Three rivers, Bhima, Ghod, and Arala, originate from the western part of the sanctuary. The crest of the sanctuary experiences high velocity winds from December to March and is completely fog-bound during the monsoon. The main physical features are ridges, hill slopes, plateaus, uplands,

gorges, ravines, cliffs, valleys, rocky stream beds, spurs with flat tops, and valleys.

Bhimashankar Sanctuary is famous for the highly endangered subspecies of the Indian Giant Squirrel *Ratufa indica elphinstoni*, locally known as Shekru. This is the State Animal of Maharashtra. At the heart of the Sanctuary is the old shrine of Bhimashankar at the origin of the River Bhima, from which it is named.

The sanctuary includes Semi-evergreen, Moist Deciduous and Scrub forest. It contains several evergreen species that are locally abundant only in restricted localities in

IN-MH-01

**CRITICALLY ENDANGERED**

White-rumped Vulture	<i>Gyps bengalensis</i>
Indian Vulture	<i>Gyps indicus</i>

**VULNERABLE**

Greater Spotted Eagle	<i>Clanga clanga</i>
Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>

**NEAR THREATENED**

Pallid Harrier	<i>Circus macrourus</i>
Tytler's Leaf-warbler	<i>Phylloscopus tytleri</i>

**ENDEMIC AREA 123: WESTERN GHATS**

Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>
Malabar Parakeet	<i>Psittacula columbooides</i>
Malabar Grey Hornbill	<i>Ocypterus griseus</i>
White-bellied Blue Flycatcher	<i>Cyornis pallipes</i>
Small Sunbird	<i>Leptocoma minima</i>

**BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST**

Malabar Trogan	<i>Harpactes fasciatus</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Yellow-browed Bulbul	<i>Iole virescens</i>
Malabar Whistling-thrush	<i>Myophonus horsfieldii</i>
Indian Scimitar-babbler	<i>Pomatorhinus horsfieldii</i>
Loten's Sunbird	<i>Cinnyris lotenius</i>

the Western Ghats. Some important plant species are *Memecylon umbellatum*, *Atlantia racemosa*, and *Xantolis tomentosa*. *Carvia callosa*, which mass-flowers periodically, is another interesting species. During monsoon, various mosses and epiphytes, including bioluminescent fungi, can be seen on the trees.

**AVIFAUNA**

Gole (2000) listed over 172 bird species in the sanctuary, including several globally Threatened and restricted-range species. The sanctuary represents the northernmost distribution of some of the restricted-range avian species of the Western Ghats. The site falls in the Western Ghats Endemic Bird Area (Stattersfield *et al.* 1998). Of the 15 Biome 10 species (BirdLife International, undated), five have been identified from Bhimashankar. The site also has 15 Biome 11 species.

The Nilgiri Wood-pigeon *Columba elphinstonii*, a globally Threatened and restricted-range species of the Western Ghats (BirdLife International 2001), generally arrives in February and can be seen or heard till the arrival of the monsoon in end June (Gole 2000). It leaves the high rainfall plateau during the monsoon, to reappear in winter. Its arrival is also dependent on the fruiting season. Several other pigeon species and parakeets such as the Blue-winged or Malabar Parakeet *Psittacula columbooides* and Plum-headed Parakeet *Psittacula cyanocephala* also visit the sanctuary from late winter onwards.

The endemic Malabar Grey Hornbill *Ocypterus griseus* is generally found below the plateau on the Konkan side but not observed on the plateau. The Yellow-browed Bulbul

*Iole virescens*, a Biome 10 species, and White-bellied Blue Flycatcher *Cyornis pallipes*, another endemic, are hill species and seldom seen below 620 msl (Gole 2000). The Small Sunbird *Leptocoma minima*, another endemic of the Western Ghats, has a good resident population.

The Near Threatened Tytler's Leaf-warbler *Phylloscopus tytleri* is extremely common in Bhimashankar and Mahabaleshwar and has the highest densities at Mahabaleshwar among all wintering warblers (Gross & Price 2005, Price & Gross 2005).

This site also has a good population of the Grey-fronted Green-pigeon *Treron affinis*. Earlier, it was considered as a subspecies of Pompadour Green Pigeon *Treron pompadura* (Ali & Ripley 1987, Grimmett *et al.* 1998), found in the Western Ghats, Sri Lanka, Eastern Ghats, and north and northeast India, but Rasmussen & Anderton (2005) upgraded it to a full species. Grey-fronted Green-pigeon is confined to the Western Ghats from Maharashtra to Kerala, and Palkonda Hills in Tamil Nadu.

Blackcrested Baza *Aviceda leuphotes* (Rane & Borges 1987) and Merlin *Falco columbarius pallidus* (Simlai & Punjabi 2008) were reported at Bhimashankar.

**OTHER KEY FAUNA**

Leopard *Panthera pardus* is the largest carnivore of Bhimashankar WLS. Its main prey species are the Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak*, Wild Boar *Sus scrofa*, Common Langur *Semnopithecus entellus*, Rhesus Macaque *Macaca mulatta*, and Mouse Deer *Moschiola meminna*. Other carnivores include the Striped Hyaena *Hyaena hyaena* and Golden Jackal *Canis aureus*. Indian Pangolin *Manis crassicaudata* is also reported, but being nocturnal, is not easily seen. The Indian Giant Squirrel *Ratufa indica* is common here (Thosre 2014).

**LAND USE**

- Tourism and recreation
- Transport
- Nature conservation and research
- Livestock grazing
- Agriculture

**THREATS AND CONSERVATION ISSUES**

- Tourism
- Livestock grazing
- Man-animal conflict
- Fuel wood gathering
- Agricultural intensification and expansion
- Commercial development
- Accidental consumption of plastics by animals

The forest remained relatively unexploited in the past, due to religious association with temples, temple forests, and sacred groves. However, nowadays, the area draws



AVINASH BHAGAT

Tytler's Leaf Warbler *Phylloscopus tytleri* is common here

thousands of tourists and there is no restriction on their movement. Vehicular disturbance, garbage, pollution of water holes, and camp fires damage the sanctuary. Tourism attracts immigrants from the neighbouring areas, and leads to illegal construction.

The forest is exploited for fuel wood and minor forest produce to meet the demands created by tourism. Grazing by livestock also affects the regeneration of the forest. Many wild and domestic animals have died as a result of consumption of plastic, which comes largely from the pilgrim and tourist traffic.

#### KEY CONTRIBUTORS

Prakash Gole, Renée Borges.

#### KEY REFERENCES

Ali, S. and Ripley, S.D. (1987) *Compact Handbook of the Birds of India and Pakistan*, 2nd edn. Oxford University Press, Delhi.

BirdLife International (2001) *Threatened Birds of Asia: The BirdLife International Red Data Book*. BirdLife International, Cambridge, UK.

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, UK, Unpubl.

Gole, P. (2000) *Survey of Birds of Bhimashankar Wildlife Sanctuary and formulation of Management guidelines for their protection*. Final Report. A project sponsored by the Forest Department, Government of Maharashtra.

Grimmett, R., Inskip, C. and Inskip, T. (1998) *Birds of the Indian Subcontinent*. Christopher Helm, A&C Black, London, UK.

Gross, S. and Price, T. (2005) Determinants of the northern and southern range limits of a warbler. *Journal of Biogeography* 27: 869-878.

Price, T. and Gross, S. (2005) Correlated evolution of ecological differences among the Old World Leaf Warblers in the breeding and non-breeding seasons. Pp. 359-372. In: Greenberg, R. and Marra, P. (eds) *Birds of Two Worlds*. Smithsonian Institution Press, Washington, DC.

Rane, U. and Borges, R. (1987) Sighting of the Blackcrested Baza (*Aviceda leuphotes*) at Bhimashankar. *JBNHS* 84(3): 679.

Rasmussen, P.C. and Anderton, J.C. (2005) *Birds of South Asia: The Ripley Guide*. Lynx Edicions, Barcelona.

Simlai, T. and Punjabi, G. (2008) First record of Merlin *Falco columbarius pallidus* from Maharashtra, India. *JBNHS* 105(3): 337.

Stattersfield, A.J., Crosby, M.J., Long, A.J. and Wege, D.C. (1998) *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. BirdLife Conservation Series No. 7. BirdLife International, Cambridge, UK.

Thosre, P. (2014) *The wild mammals of Maharashtra*. Published by Mrs. Deepti Thosre. Pp.100.

## BURNT ISLAND (VENGURLA ROCKS)

<b>IBA Site code</b>	: IN-MH-02
<b>District</b>	: Sindhudurg
<b>Coordinates</b>	: 15° 55' 09" N, 73° 30' 20" E
<b>Ownership</b>	: State
<b>Area</b>	: Not available

<b>Altitude</b>	: 25–45 msl
<b>Rainfall</b>	: Not available
<b>Temperature</b>	: Not available
<b>Biogeographic Zone</b>	: Island
<b>Habitat</b>	: Tropical Secondary Scrub

**IBA CRITERIA:** A3 (Biome 10: Indian Peninsula Tropical Moist Forest); A4iii ( $\geq 20,000$  waterbirds or 10,000 pairs seabirds)

**PROTECTION STATUS:** Not officially protected.



### GENERAL DESCRIPTION

Burnt Island (Vengurla Rocks) has been proposed as a potential Ramsar Site in India as it qualifies for Ramsar Criteria 2 (wetland supports threatened ecological communities), Criteria 4 (wetland provides refuge during adverse conditions to threatened species), Criteria 5 (wetland regularly supports 20,000 or more waterbirds), and Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies), and for its high ecological values (Islam & Rahmani 2008).

Burnt Island, among the Vengurla Rocks in the Arabian Sea, is an archipelago c. 14 km west to northwest of Vengurla Port. The archipelago comprises about 20 islets in an area

extending 5 km from north to south and 1.6 km from east to west. Detailed study on the flora and fauna has not been done. The rocks at Vengurla are quite bare, but the crevices are covered with grasses and shrubs. The main grass is *Cymbopogon*, with scattered *Celosia argentea* and *Mollugo sperbula*. The grasses provide shelter for chicks and fledglings of terns and other species.

### AVIFAUNA

A.O. Hume visited this island to collect some information on the fauna (Hume 1876). He mentioned sea birds and swiftlets. In 1938, Abdulali (1940) visited this area and recorded that the Vengurla Rocks Archipelago is a nesting

site for marine birds, terns, pigeons, and swiftlets. Much later, Heinz Lainer saw 18 Brown Noddies *Anous stolidus* during his visit on September 9, 1997 to the island (Lainer 1999). Katdare (2001) visited Vengurla Rocks on June 6, 2001 and reported sighting 800 Bridled Tern *Onychoprion anaethetus*, 300 Great Crested Tern *T. bergii*, 150 Roseate Tern *S. dougallii* and 5 Lesser Crested Tern *T. bengalensis* on the rocks. Pande (2002a) observed over 18,000 Indian Edible-nest Swiftlet *Collocalia unicolor* at Burnt Island during his survey. The site therefore qualifies as an IBA according to congregation criteria A4iii. Pande (2002b) saw a flock of 22 Pomarine Jaeger *Stercorarius pomarinus* flying southward. In the Indian seas, this is a rare visitor (Grimmett et al. 2011). Pande (2002b,c) recorded eight species of terns, namely Common Tern *Sterna hirundo*, Roseate Tern *S. dougallii*, White-cheeked Tern *S. repressa*, Bridled Tern *O. anaethetus*, Sooty Tern *O. fuscata*, Large Crested Tern *T. bergii*, Lesser Crested Tern *T. bengalensis*, and Indian River Tern *S. aurantia*. In addition, Ruddy Turnstone *Arenaria interpres*, Common Sandpiper *Actitis hypoleucus*, Indian Reef Heron *Egretta gularis*, and White-bellied Sea Eagle *Haliaeetus leucogaster* were also recorded.

Lainer (2003) has reviewed the terns of Vengurla Rocks. He visited the island 12 times during 1988–1989 and 1997–1998, covering all seasons and months except January, February, July, and November. In August 1998, he saw an immense cloud of over 15,000 terns on the leeward side of Burnt Island. He mentions that, in addition, a conservatively estimated 10,000 terns were spread over the less steep seaward side, but a species-wise breakup was impossible. As he mentions, a minimum of 10,000 Roseate Tern *Sterna dougalli*, 3,000 Bridled Tern *O. anaethetus*,

NEAR THREATENED	
River Tern	<i>Sterna aurantia</i>
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
Indian (Edible-nest) Swiftlet	<i>Collocalia unicolor</i>
CONGREGATORY SPECIES	
Roseate Tern	<i>Sterna dougallii</i>
White-cheeked Tern	<i>Sterna repressa</i>
Large Crested Tern	<i>Thalasseus bergii</i>
Bridled Tern	<i>Onychoprion anaethetus</i>
Sooty Tern	<i>Onychoprion fuscata</i>

and 2,000 Large Crested Tern *T. bergii* bred during the southwest monsoon of 1998 on the leeward side of Burnt Island. These numbers would increase by 30% if one were to assume that the >10,000 terns on the seaward side were of an identical or at least similar species break-up. He also sighted 10 Lesser Crested Tern, eight Sooty Tern, over 50 Large Crested Tern and at least three Sandwich Tern *S. sandvicensis* during his visits.

Katdare et al. (2004) found 800 Bridled Tern and their eggs laid all over the island. They sighted 300 Large Crested Tern and counted 17 eggs. They also sighted five Lesser Crested and 150 Roseate Terns. Madsen (1988) sighted 20–25 Large Crested Tern *T. bergii* and 15–20 Brown-winged (Bridled) Tern *S. anaethetus* on his way to the Vengurla Rocks in May 1988. He sighted 20 White-cheeked Tern *S. repressa* and 300–500 Sooty Tern *O. fuscata* on the island.

#### OTHER KEY FAUNA

The carapace of Olive Ridley Turtle *Lepidochelys olivacea* was collected from this IBBA, suggesting the occurrence of this species in the proximity of the island. Dolphins were seen



A pair of Large Crested Tern *Thalasseus bergii* with juvenile



Large Crested Tern *Thalasseus bergii* breeds on Burnt Island in huge numbers

in nearby waters. A small unidentified bat species was observed in the cave where the swiftlets were found (Pande 2002b).

#### LAND USE

- Not known

#### THREATS AND CONSERVATION ISSUES

- Removal of nests of the Indian (Edible-nest) Swiftlet.

The nests of the swiftlets are believed to have aphrodisiac and medicinal properties in East Asian countries and are prey to poachers. Burnt Island was one of two localities that supplied these nests (Ali & Ripley 1987). Pande (2002a, b) reported large-scale poaching of nests and recommended that the area be put under some form of protection.

Poaching and egg collection has completely stopped on this island. Due to awareness created among the local community, the residents have become vigilant towards the protection of the species. Even minor incidents are reported back to Sahyadri Nisarg Mitra (SNM). SNM members visit the island at least once a year to monitor the situation. Initially, the need was felt for additional infrastructure to combat the smuggling of swiftlet nests. Now, the poaching of nests and collection of eggs on the island has stopped entirely (Vishwas Katdare, *pers. comm.* 2012).

#### KEY CONTRIBUTORS

Satish Pande, Vishwas Katdare.

#### KEY REFERENCES

Abdulali, H. (1940) Swifts and Terns at Vengurla Rocks. *JBNHS* 41: 661–665.

Ali, S. and Ripley, S.D. (1987) *Compact Handbook of the Birds of India and Pakistan*, 2nd edn. Oxford University Press, Delhi.

Grimmett, R., Inskip, C. and Inskip, T. (2011) *Birds of the Indian Subcontinent* 2nd edn. Christopher Helm (Publishers) Ltd., Oxford, UK.

Hume, A.O. (1876) Laccadives and the West Coast. *Stray Feathers* 4 (4, 5, 6): 413–483.

Islam, M.Z. and Rahmani, A.R. (2008) Potential and Existing Ramsar Sites in India. Indian Bird Conservation Network, BNHS, BirdLife International and Royal Society for the Protection of Birds, UK. Oxford University Press. Pp. 592.

Katdare, V. (2001) Swifts on Vengurla Rocks. *Newsletter for Birdwatchers* 41(4): 54.

Katdare, V., Mone, R. and Palkar, S. (2004) Nesting of terns on Vengurla Rocks, District Sindhudurg, Maharashtra. *JBNHS* 101(2): 318–319.

Lainer, H. (1999) The Noddy Tern (Brown Noddy) *Anous stolidus* off the South Konkan coast. *JBNHS* 96(3): 469.

Lainer, H. (2003) Terns of the Vengurla Rocks, a review and update. *JBNHS* 100(1): 126–135.

Madsen, S.T. (1988) Terns of the Vengurla Rocks. *Hornbill* 1988(1): 3–4, 29.

Pande, S.A. (2002a) Conservation of Habitat and Documentation of the Nesting Status of Indian Edible-nest Swiftlets and Marine Terns of the Vengurla Rocks – A Report. Ela Foundation, Pune. Pp. 42.

Pande, S.A. (2002b) A Rocky Adventure at Vengurla Islands. *Hornbill* April–June 2002(2): 22–24.

Pande, S.A. (2002c) Terns nesting on the Vengurla Rocks Archipelago. *Newsletter for Birdwatchers* 42(1): 10–12.

## GANGAPUR DAM AND GRASSLANDS

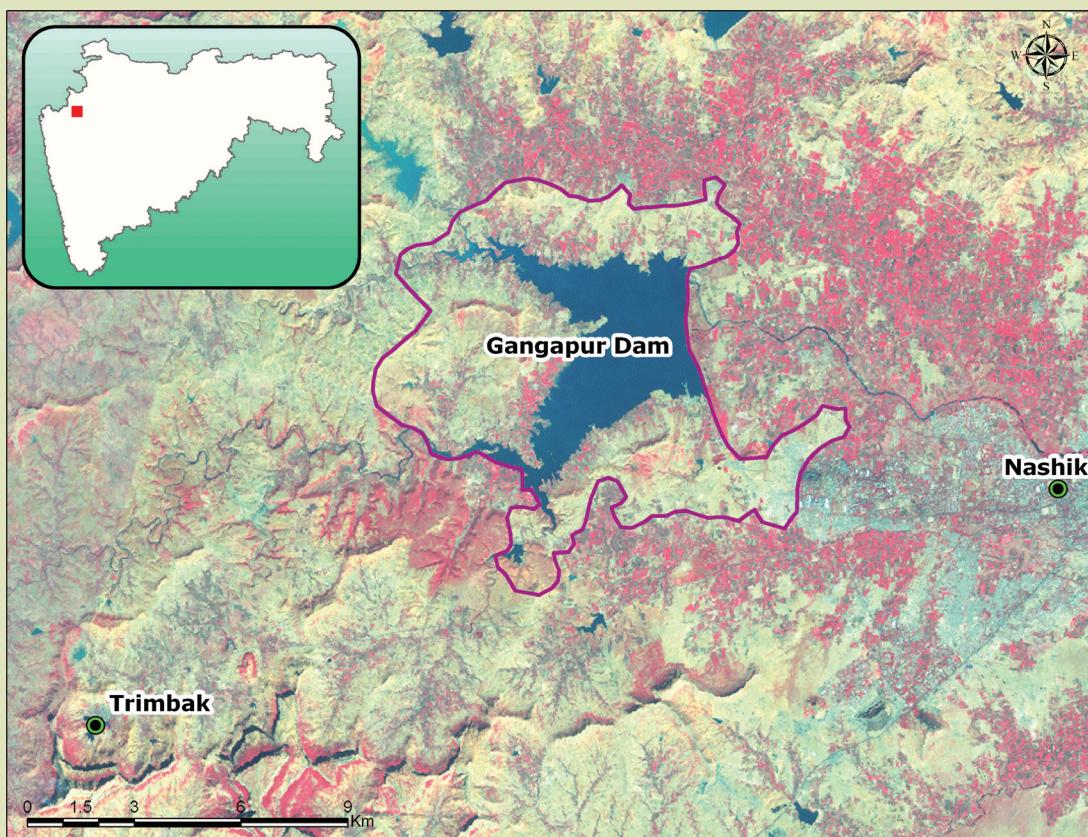
IN-MH-03

<b>IBA Site Code</b>	: IN-MH-03
<b>District</b>	: Nashik
<b>Coordinates</b>	: 20° 03' 00" N, 73° 40' 60" E
<b>Ownership</b>	: Irrigation (State), Private
<b>Area</b>	: 4,000 ha

<b>Altitude</b>	: 600 msl
<b>Rainfall</b>	: 1,500–2,000 mm
<b>Temperature</b>	: 4 °C to 42 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula
<b>Habitats</b>	: Freshwater Reservoir, Tropical Grassland

**IBA CRITERIA:** A1 (Threatened Species), A4i ( $\geq 1\%$  biogeographic population) A4iii ( $\geq 20,000$  waterbirds)

**PROTECTION STATUS:** Not officially protected.



### GENERAL DESCRIPTION

Gangapur Dam is situated 16 km from Nashik city. It was constructed in 1956–57 to supply drinking water to Nashik. The area around the reservoir is undulating grassland with patches of agricultural fields. Not much is known about the aquatic vegetation. The dominant grasses are *Heteropogon contortus*, *Dicanthium annulatum*, and *Cymbopogon martinii*.

### AVIFAUNA

Gangapur Dam is a large freshwater body surrounded by grasslands, where huge congregations of birds, sometimes over 20,000, are seen during winter (October–March). A total of 210 bird species have been recorded, of which six are

listed as Threatened and six are Near Threatened according to BirdLife International (2012).

According to B. Raha (*pers. comm.* 2012), the most common duck is the Common Pochard *Aythya ferina*. Sometimes, more than 10,000 are seen. According to Wetlands International (2006), this is *c.* 1% of the biogeographic population that winters in South Asia. Blue-winged Teal *Anas querquedula*, Northern Pintail *A. acuta*, Gadwall *A. strepera*, and Northern Shoveller *A. clypeata* are also seen in hundreds. Sometimes  $>2,000$  Little Cormorant *Phalacrocorax niger* and Indian Cormorant *P. fuscicollis* are found fishing. The 1% population threshold of Little Cormorant is 1,500 (Wetlands International 2006). In



PRASHANT GAHALE

Bluethroated *Luscinia svecica* is a common winter visitor here

December 2011, nearly 25,000 waterbirds were counted in Gangapur Dam.

The site lies in Biome 11 (Indo-Malayan Tropical Dry Zone). BirdLife International (undated) has listed 59 species in this biome, of which 16 have been recorded in Gangapur. The most interesting sighting is of the globally Threatened Lesser Florican *Sypheotides indicus* in the Gangapur grasslands. This rare species has been seen breeding in the nearby grasslands of a defence establishment (Raha & Prakash 2001). Unfortunately, there has been no sighting of Lesser Florican after 2006 (B. Raha, *pers. comm.* 2012).

Some unusual records include Orltolan Bunting *Emberiza hortulana* from the Gangapur grasslands (Raha 2003b) and Black-necked Grebe *Podiceps nigricollis* in Gangapur Dam (Raha *et al.* 2005).

#### OTHER KEY FAUNA

Detailed studies of mammals and other animals have not been done. The Striped Hyaena *Hyaena hyaena* and Golden Jackal *Canis aureus* are seen occasionally.

#### LAND USE

- Agriculture
- Irrigation project

#### THREATS AND CONSERVATION ISSUES

- Poaching
- Overgrazing in the grassland
- Illegal mining of clay and stones (Raha 2013)
- Proposal to start boating club and water sports centre in the backwaters

Earlier, poaching of waterfowl and grassland birds was common, but as a result of conservation initiatives undertaken by the Nature Conservation Society (NCS), Nashik these have been reduced to some extent (Raha 2002,

#### CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps benghalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>

#### ENDANGERED

Lesser Florican	<i>Sypheotides indica</i>
Asian Woollyneck	<i>Ciconia episcopus</i>
Lesser White-fronted Goose	<i>Anser erythropus</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>

#### VULNERABLE

Oriental Darter	<i>Anhinga melanogaster</i>
Red-headed Falcon	<i>Falco chicquera</i>
Great Thick-knee	<i>Esacus recurvirostris</i>
Black-tailed Godwit	<i>Limosa limosa</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>

#### NEAR THREATENED

Raha & Bhure 2002). BNHS and Nature Conservation Society have jointly conducted a bird banding programme here, which has also helped create interest in bird conservation. In 2012, Maharashtra Tourism Corporation Limited (MTDC) proposed a boating club and water sports centre in the backwaters of Gangapur Dam. However the Nature Conservation Society of Nashik successfully fought the issue through strong advocacy and media support. Even the villagers residing in nearby villages supported the cause of nature. Finally, a government circular declaring a ban on any construction activities on wetlands which figure on Central Government maps was issued. Later, a plan to land a seaplane in the dam was also stopped due to strong protests by BNHS and NCS. At present, these so called developmental activities have been stopped (Raha 2013). Low scale illegal quarrying of clay and stones (*murum*) is reported.

#### KEY CONTRIBUTORS

B. Raha, N. Bhure.

#### KEY REFERENCES

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, UK. Unpubl.

Raha, B. (2002) Sightings of Orltolan Bunting *Emberiza hortulana* at the grassland around Gangapur, Nasik. *JBNHS* 99(3): 536.

Raha, B. (2003) Local stake-holders conserve Gangapur grassland. *Mistnet* 4(2): 14.

Raha, B. (2013) The saga of Gangapur (Nashik) an Important Bird Area. *Mistnet* 14(4): 11-13.

Raha, B. and Bhure, N. (2002) Conservation education for communities in and around Gangapur dam and grassland (IBA site). *Mistnet* 3(4): 2. Published 2003.

Raha, B. and Prakash, V. (2001) Occurrence of Lesser Florican *Sypheotides indica* at Hosur, in Nashik district, Maharashtra. *JBNHS* 98(2): 279.

Raha, B., Bhure, N., Sarda, R. and Bob, I. (2005) Sighting of Black-necked Grebe *Podiceps nigricollis* at Gangapur Dam, Nashik District, Maharashtra, India. *Indian Birds* 1(1): 13.

Wetlands International (2006) *Waterbird Population Estimates – Fourth Edition*. Wetlands International, Wageningen, The Netherlands. Pp. 239.

# INS SHIVAJI AND ADJOINING AREAS, LONAVLA

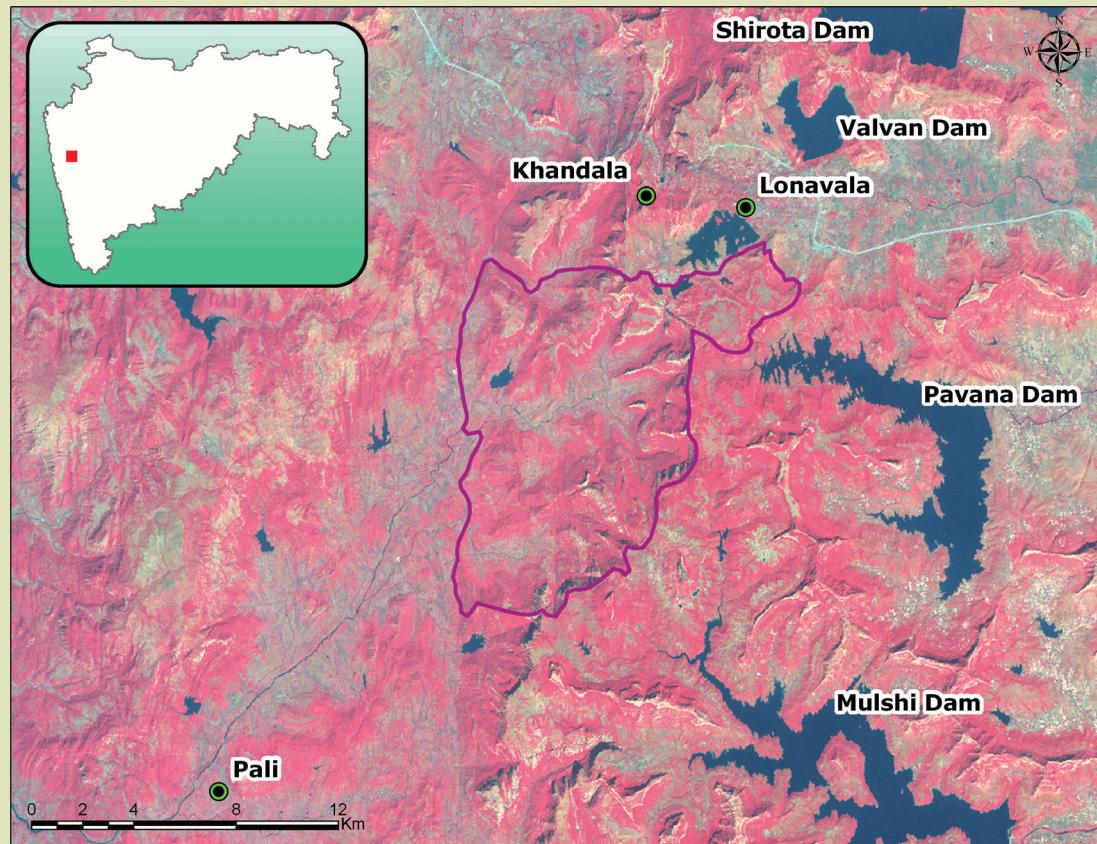
IN-MH-04

<b>IBA Site Code</b>	: IN-MH-04
<b>District</b>	: Pune, Raigad
<b>Coordinates</b>	: 18° 46' 10" N, 73° 24' 46" E
<b>Ownership</b>	: Military, State, Tata Hydroelectric Co.
<b>Area</b>	: c. 1,000 ha

<b>Altitude</b>	: 100–1,100 msl
<b>Rainfall</b>	: 4,000–5,000 mm
<b>Temperature</b>	: 12 °C to 34 °C
<b>Biogeographic Zone</b>	: Western Ghats
<b>Habitats</b>	: Semi-evergreen Forest, Moist Deciduous Forest

**IBA CRITERIA:** A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats),  
A3 (Biome 10: Indian Peninsula Tropical Moist Forest)

**PROTECTION STATUS :** Not officially protected.



## GENERAL DESCRIPTION

INS Shivaji, established in 1945, is a premier training base of the Indian Navy located c. 6 km west of Lonavla town, a popular tourist resort in the Sahyadri Hills. Lonavla (650 msl) is situated c. 120 km from Mumbai on the main road and rail link with Pune. The presence of this defence establishment, spread over 1,500 acres, has served to protect some valuable original Tropical Moist/Semi-evergreen forest and upland grassland habitats against growing urbanization and development. Inaccessible valleys to the west of Lonavla still hold good expanses of primary Moist Tropical and

Semi-evergreen forest. The surrounding hills provide very good upland grassland habitats during the postmonsoon months. The area beyond Khandala towards Duke's Nose Hill and extending towards Tiger's Leap ravine along the top of the ridges, and up to 2 km on either side of the ridges, is proposed as an IBBA.

The area is typical of the Western Ghats, with evergreen and moist deciduous vegetation and high diversity of plant species. The carnivorous plant *Utricularia* sp. is common in small springs, and plays an important role in the ecology, particularly the nitrogen cycle of the area. Karvi *Carvia*

**CRITICALLY ENDANGERED**

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>

**VULNERABLE**

Asian Woollyneck	<i>Ciconia episcopus</i>
Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>
Indian Broad-tailed Grass-warbler	<i>Schoenicola platyurus</i>

**NEAR THREATENED**

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Pallid Harrier	<i>Circus macrourus</i>
Red-necked Falcon	<i>Falco chicquera</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

**ENDEMIC BIRD AREA 123: WESTERN GHATS**

Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>
Malabar Parakeet	<i>Psittacula columboides</i>
Malabar Grey Hornbill	<i>Ocypterus griseus</i>
White-bellied Blue Flycatcher	<i>Cyornis pallipes</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Indian Broad-tailed Grass-warbler	<i>Schoenicola platyura</i>
Small Sunbird	<i>Leptocoma minima</i>
Vigor's Sunbird	<i>Aethopyga vigorsii</i>

**BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST**

White-cheeked Barbet	<i>Megalaima viridis</i>
Yellow-browed Bulbul	<i>Iole indica</i>
Malabar Whistling-thrush	<i>Myophonus horsfieldii</i>
Indian Scimitar-babbler	<i>Pomatorhinus horsfieldii</i>
Loten's Sunbird	<i>Cinnyris lotenius</i>

*callosa* is a dominant plant on the hill slopes. Tree species Kumbha *Careya arborea*, Anjani *Memecylon umbellatum*, Nirgundi *Vitex negundo*, and Ranperu *Randia dumetorum* are commonly found here. Some medicinal plants such as Dhyati *Woodfordia fruticosa*, Ashvagandha *Withania somnifera*, and Jungli Kanda *Vernonia cinerea* are also found.

**AVIFAUNA**

In the Lonavla-Khandala area, at least 328 bird species are recorded (Pande *et al.* 2011). The birds of INS Shivaji and adjoining areas were studied from September 11 to November 10, 2002, and during a short visit earlier on March 12 to 14, 2002. A total of 225 species were recorded during this period. The steep cliff facing west of INS Shivaji has a sizeable nesting population of the Long-billed Vulture or Indian Vulture *Gyps indicus*, a Critically Endangered species. Flocks of up to 20 birds were regularly seen. Two juvenile birds were seen on cliff ledges on many occasions in September 2002, indicating successful breeding. One pair of Peregrine Falcon *Falco peregrinus* and three pairs of Common Kestrel *Falco tinnunculus* also inhabit these cliffs.

During the study period, a male Red Junglefowl *Gallus gallus* was seen on two occasions, indicating the presence of a small isolated population, hundreds of kilometres from the limit of its main geographical range. Possibly these are introduced or escaped birds. Ali & Ripley (1987) mention that Charles McCann had seen Red Junglefowl in the outliers of Western Ghats near Bombay (=Mumbai). The species has also been reported from Khandala, which is near Lonavla. Grimmett *et al.* (2011) have shown this area in the distribution map of Red Junglefowl. The Grey Jungle Fowl (*Gallus sonneratii*) is particularly common here.

Near Threatened species such as the Painted Stork *Mycteria leucocephala*, Black-headed Ibis *Threskiornis melanocephalus*, Oriental Darter *Anhinga melanogaster*, and Pallid Harrier *Circus macrourus* are regulars in the waterbodies and around cultivation. Red-necked Falcon *Falco chicquera* is also seen in this IBA.

A breeding colony of River Tern *Sterna aurantia*, Small Pratincole *Glareola lactea*, and Red-wattled Lapwing *Vanellus indicus* was reported at Lonavla (Unnithan & Unnithan 2003).

Nine of the 16 restricted-range species of the Western Ghats Endemic Bird Area (EBA123) and six of the 15 Biome 10 species are found in this IBA. Tytler's Leaf-warbler *Phylloscopus tytleri* is also recorded from this area (K.B.Singh, *pers.comm.* 2003). Vigor's Sunbird *Aethopyga vigorsii*, Malabar Whistling-thrush *Myophonus horsfieldii*, Indian Scimitar-babbler *Pomatorhinus horsfieldii*, White-



Malabar Whistling Thrush *Myophonus horsfieldii* inhabits  
INS Shivaji

PRASHANT GAHALE



BISHAN MONNAPPA

White-bellied Blue Flycatcher *Cyornis pallipes*, endemic to the Western Ghats, has been reported from INS Shivaji

cheeked Barbet *Megalaima viridis* and Indian Swiftlet *Aerodramus unicolor* is common in the hills of Khandala village (Raju Kasambe, *pers. obs.* 2015).

The site lies in Biome 10 (Indian Peninsula Tropical Moist Forest) and hosts typical representatives of this biome. However, many species of other biomes are also found here. For example, Tickell's Thrush *Turdus unicolor* and Blue-headed Rock-Thrush *Monticola cinclorhynchus*, typical of Sino-Himalayan Subtropical Forest and Tickell's Warbler *Phylloscopus affinis* of the Eurasian High Montane winter in this IBA. Over 30 species of Indo-Malayan Tropical Dry Zone (Biome 11) commonly seen here further enrich the avifauna.

#### OTHER KEY FAUNA

Leopard *Panthera pardus* is the major predator, still found in this area and surrounding jungles. Its main natural prey is the Bonnet Macaque *Macaca radiata*, but it also subsists on cattle and stray dogs.

Among the reptiles, Uropeltid snakes are common. This site has many threatened amphibian species such as the Bombay Bush Frog *Philautus bombayensis* and Humayun's Wrinkled Frog *Nyctibatrachus humayuni*. *Indotyphlus battersbyi*, an endangered and endemic caecilian, inhabits the area (Varad Giri, *pers. comm.* 2011).

#### LAND USE

- Defence establishment
- Reserve Forest
- Roads and railway lines
- Generation of hydel power

#### THREATS AND CONSERVATION ISSUES

- Deforestation
- Roads and railways
- Land development

The richness and diversity of this area has been preserved to a large extent due to the strategic presence of a defence establishment, which has served as a bulwark to protect the habitat against the immense pressures of urbanization, tourism, and development. The Mumbai-Pune corridor is on the fast track to development. Severe pressures will therefore continue to play havoc with these pristine habitats unless conservation measures are initiated at the earliest.

#### KEY CONTRIBUTOR

Lt. Cdr. Kanwar Bir Singh, Varad Giri, and Raju Kasambe.

#### KEY REFERENCES

Ali, S. and Ripley, S.D. (1987) *Compact Handbook of the Birds of India and Pakistan*, 2nd edn. Oxford University Press, Delhi.  
 Grimmett, R., Inskip, C. and Inskip, T. (2011) *Pocket Guide to the Birds of the Indian Subcontinent*. Oxford University Press, New Delhi.  
 Pande, S., Vishwasrao, V., Sant, N. and Deshpande, P. (2011) *Birds of Lonavla and Khandala including some butterflies, reptiles, amphibians and mammals*, 2nd rev. edn. Ela Foundation, Pune, India. Pp. 218.  
 Unnithan, S. and Unnithan, G.V.K. (2003) A breeding colony of River Tern *Sterna aurantia*, Small Pratincole *Glaucostola lactea* and Red-wattled Lapwing *Vanellus indicus* at Lonavla. *JBNHS* 99(3): 522–525.

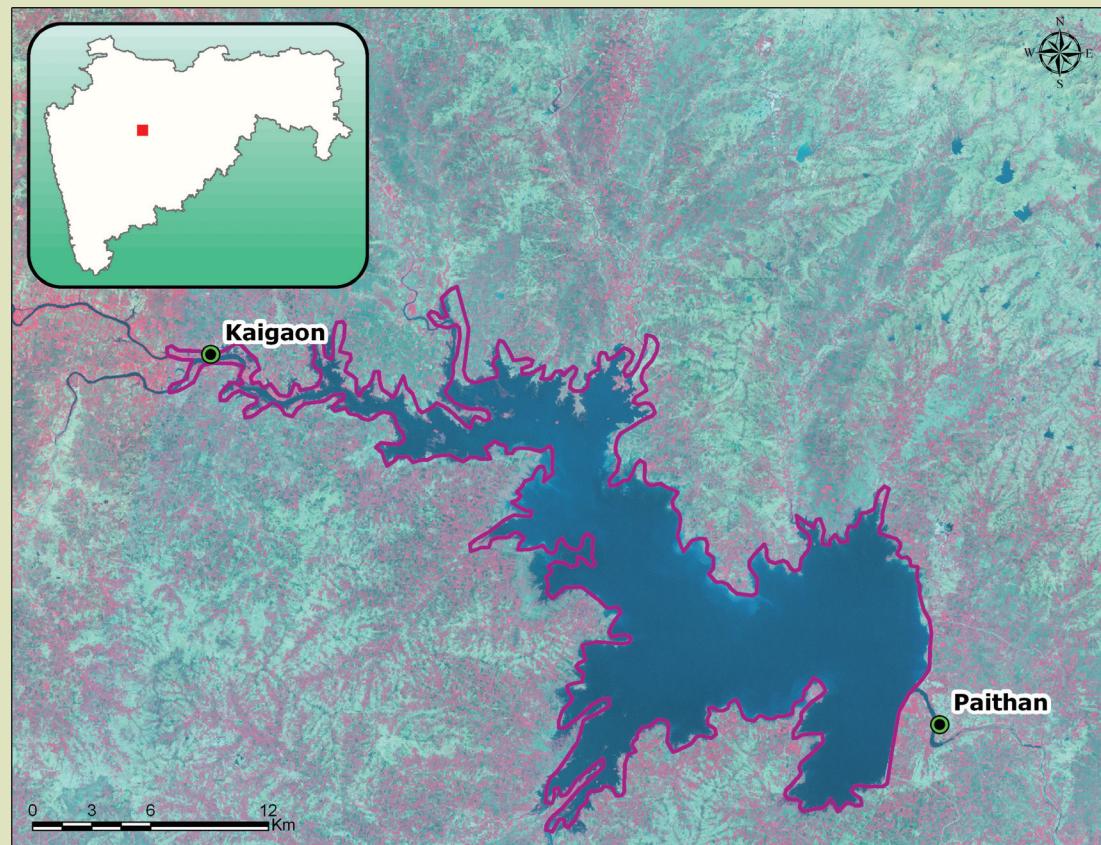
## JAIKWADI BIRD SANCTUARY

<b>IBA Site Code</b>	: IN-MH-05
<b>District</b>	: Ahmednagar, Aurangabad
<b>Coordinates</b>	: 19° 29' 43" N, 75° 17' 37" E
<b>Ownership</b>	: State
<b>Area</b>	: 34,105 ha

<b>Altitude</b>	: 465 msl
<b>Rainfall</b>	: 600 mm
<b>Temperature</b>	: 15 °C to 40 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula
<b>Habitat</b>	: Freshwater Reservoir

**IBA CRITERIA:** A1 (Threatened Species), A4i (>1% biogeographic population), A4iii (>20,000 waterbirds), A4iv (the site is known or thought to exceed thresholds set for migratory species)

**PROTECTION STATUS :** Wildlife Sanctuary, established in 1986.



### GENERAL DESCRIPTION

Jaikwadi Sanctuary was proposed as a potential Ramsar Site in India as it meets Ramsar Criteria 2 (wetland supports threatened ecological communities), Criteria 4 (wetland provides refuge during adverse conditions to threatened species), Criteria 5 (wetland regularly supports 20,000 or more waterbirds), and Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies), and for its high ecological values (Islam & Rahmani 2008). Jaikwadi Sanctuary is a man-made reservoir that was created after the construction of a dam in 1975 in the upper reaches of River Godavari. In the absence of natural

depressions and hilly terrain, this dam has been constructed on almost flat land, because of which the impounded waterspread is large, approximately 55 km long and 27 km wide. This shallow waterspread, with a receding waterline is very attractive to a large number of waterfowl and waders. Considering its importance to waterfowl, the Government of Maharashtra declared this wetland as Jaikwadi Bird Sanctuary on October 10, 1986. Out of the total area of 34,100 ha, 33,974 ha are under the control of the Irrigation Department.

The reservoir area was acquired from 118 villages. The waterbody at Jaikwadi has been named Nathsagar reservoir



DR. SUDHANSU KOTHE

Jaikwadi is the wintering ground for thousands of migratory waterbirds

after the great saint-poet Eknath (Anon 2005). Jaikwadi Dam is near the sacred town Paithan in Aurangabad district.

## AVIFAUNA

Vyawahare & Kulkarni (1987) reported the occurrence of 150 species of birds at Jaikwadi, including the Critically Endangered Red-headed Vulture *Sarcogyps calvus*, Endangered Egyptian Vulture *Neophron percnopterus*, and Near Threatened Black-tailed Godwit *Limosa limosa*. The Forest Department has recorded 215 species at Jaikwadi (Anon. 2005) and 264 species of birds in the entire Aurangabad district (Yardi 2000). Mahabal (2005) had also studied the fauna of Nathsagar Wetland and Jaikwadi Bird Sanctuary. According to a recent book published by the Forest Department (Anon, 2013), 269 species has been reported here. These include Great Indian Bustard *Ardeotis nigriceps* which is found around backwaters in Gangapur tehsil (District Ahmednagar), Marbled Teal *Marmaronetta angustirostris*, Spotted Treecreeper *Salpornis spilonotus*, Asian Fairy Bluebird *Irena puella*, and Indian Spotted Eagle *Aquila hastata*.

Yardi *et al.* (2008) reported the occurrence of 64 residential and 24 non-residential species of birds at Jaikwadi. Another recent study has reported 213 species of birds in the sanctuary area (Yardi 2011). Over 10,000 Demoiselle Crane *Grus virgo* and a congregation of over 50,000 birds were seen here during an IBA survey in 2000, which included many species in much larger numbers than their 1% biogeographic population thresholds, as determined by Wetlands International (2006). The site also has many Near Threatened species.

The site is an important stopover in the migratory flyway of cranes and other birds, which congregate here during their return migration, so it satisfies A4iv criteria.

The aquatic vegetation mainly includes species of *Chara*, *Spirogyra*, *Hydrilla*, *Potamogeton*, and *Vallisneria*.

CRITICALLY ENDANGERED	
White-rumped Vulture	<i>Gyps bengalensis</i>
Red-headed Vulture	<i>Aegypius calvus</i>
Great Indian Bustard (old record)	<i>Ardeotis nigriceps</i>
ENDANGERED	
Egyptian Vulture	<i>Neophron percnopterus</i>
VULNERABLE	
Asian Woollyneck	<i>Ciconia episcopus</i>
Marbled Teal	<i>Marmaronetta angustirostris</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Indian Spotted Eagle	<i>Clanga hastata</i>
NEAR THREATENED	
Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Lesser Flamingo	<i>Phoeniconaias minor</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Pallid Harrier	<i>Circus macrourus</i>
Red-headed Falcon	<i>Falco chicquera</i>
Great Thick-knee	<i>Esacus recurvirostris</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>

*Argemone mexicana* and *Ipomoea fistulosa* are found in the surrounding area. Nearby areas are irrigated agricultural fields. The construction of Jaikwadi reservoir has changed ecological conditions from semi-arid to rich cultivated fields.

## OTHER KEY FAUNA

Not many large mammals are seen as the area is under intensive agriculture and human occupation. Occasionally, Blackbuck *Antilope cervicapra* are observed here (Anon. 2005). Golden Jackal *Canis aureus*, Indian Fox *Vulpes bengalensis*, and Black-naped Hare *Lepus nigricollis* are

commonly seen. The Forest Department has listed 67 species of fish in Jaikwadi (Anon. 2005).

## LAND USE

- Agriculture
- Fishing

## THREATS AND CONSERVATION ISSUES

- Livestock grazing
- Agricultural intensification and expansion
- Fisheries
- Industrialization
- Urbanization
- Pollution

Fishing is the most contentious issue in Jaikwadi Sanctuary. At present, there are 27 fishing cooperatives with 5,000 registered members in Nathsagar. Fishing is the main source of livelihood for the communities that live around the wetland. Before the construction of the dam, the local villagers did not know much about fishing. However, many outsiders have settled here now who, along with the local population, are mainly occupied in fishing. Poaching of waterfowl by the local Pardhi, Bhil, and Kahar communities is not uncommon, although it has been brought under control.

Agriculture is practiced all around the reservoir. As soon as the water starts receding, farmers till the wet soil and sow seeds. This agriculture is locally known as *galapara*. Farmers use potent pesticides that ultimately contaminate the water. At present there are 61 villages on either side of the reservoir. Land is rented out for agriculture by the Irrigation Department.

Grazing is another major problem as livestock does not leave any area undisturbed for birds to nest. The greatest threat to wildlife and to agriculturists is the pollution from industries and sugar mills that discharge effluents into the reservoir. Sewage from Aurangabad, Paithan, Maharashtra Industrial Development Corporation, and 61 villages is discharged into the Nathsagar reservoir.

In 2013, the Forest Department had announced six sites

were identified to be declared as Ramsar Sites. They are Jaikwadi Bird Sanctuary (Aurangabad district), Navegaon Bandh Reservoir (Gondia district), Nandur Madhmeshwar Wildlife Sanctuary (Nashik district), Ujjani Reservoir (Pune district), Sewri Creek (Mumbai district), and Lonar Crater Wildlife Sanctuary (Buldhana district) (<http://www.downtoearth.org.in/news/maharashtra-to-propose-five-wetland-sites-for-recognition-as-ramsar-sites-40159> as accessed on 05 September 2015). However, nothing has happened till date.

## KEY CONTRIBUTORS

B. Raha, N. Bhure.

## KEY REFERENCES

Anon. (2013) *Birds of Jayakwadi Bird Sanctuary, Dist. Aurangabad*. Published by Deputy Conservator of Forests (Wildlife), Aurangabad Wildlife Division Aurangabad. Pp.48.

Islam, M.Z. and Rahmani, A.R. (2008) *Potential and Existing Ramsar Sites in India*. Indian Bird Conservation Network, BNHS, BirdLife International and Royal Society for the Protection of Birds, UK. Oxford University Press. Pp. 592.

Anon. (2005) Management Plan for the Jayakwadi Bird Sanctuary. Published by Deputy Conservator of Forests, Aurangabad Wildlife Division, Government of Maharashtra Aurangabad.

Mahabal, A. (2005) *Fauna of Nathsagar Wetland and Jayakwadi Bird Sanctuary (Maharashtra)*. Zoological Survey of India, Kolkata. Pp. 191.

Vyawahare, P.M. and Kulkarni, A.B. (1987) Checklist of birds from Jaikwadi Dam area – Paithan, Aurangabad, Maharashtra. *Pavo* 24 (1&2): 9–24.

Wetlands International (2006) *Waterbird Population Estimates – Fourth Edition*. Wetlands International, Wageningen, The Netherlands. Pp. 239.

Yardi, D. (2000) Birds Checklist. Aurangabad Wildlife Circle, Aurangabad.

Yardi, D. (2011) Eco-Sustainability of Jaikwadi dam with reference to Bird Sanctuary. Ph.D. thesis. Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

Yardi D., Patil, S.S., Bandela, N.N. and Auri, R.G. (2008) Conservation of birds of Jaikwadi Dam, a Proposed Ramsar Site, Aurangabad. Pp. 547–553. In: Sengupta, M. and Dalwani, R. (eds) *Proceedings of Taal-2007: The 12th World Lake Conference, Jaipur*.

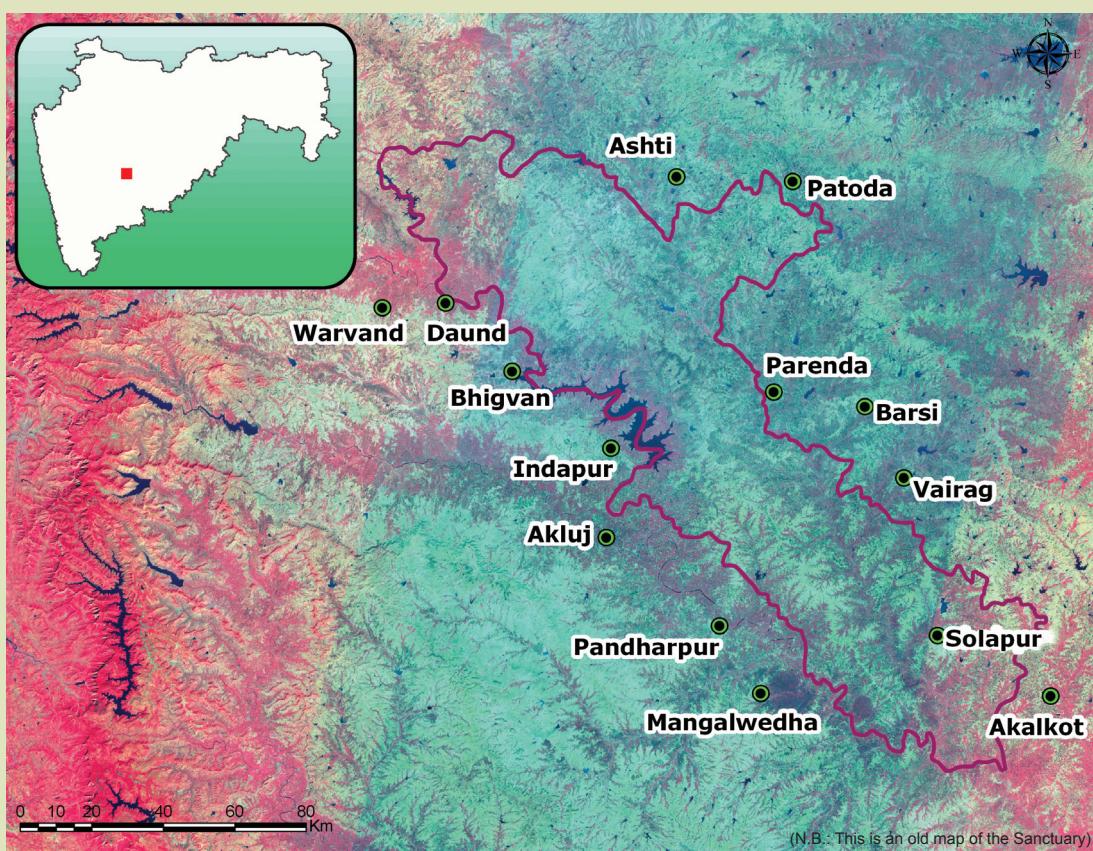
## GREAT INDIAN BUSTARD SANCTUARY (NANNAJ AND OTHER GRASSLAND PLOTS)

<b>IBA Site</b>	: IN-MH-06
<b>District</b>	: Solapur, Ahmednagar
<b>Coordinates</b>	: 18° 21' 00" N, 75° 11' 38" E
<b>Ownership</b>	: State
<b>Area</b>	: 1222.61 ha (at present)

<b>Altitude</b>	: 450–500 m
<b>Rainfall</b>	: 724 mm
<b>Temperature</b>	: 13 °C to 42 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula
<b>Habitat</b>	: Tropical Grassland, Southern Tropical Thorn Forest

**IBA CRITERIA : A1 (Threatened Species)**

**PROTECTION STATUS :** Wildlife Sanctuary, established in 1979.



### GENERAL DESCRIPTION

The Great Indian Bustard Sanctuary is situated in Solapur and Ahmednagar districts. Previously, it covered a huge area of 8,496.44 sq. km according to the Notification through notification No. WLP/1078/72634/F-1 (Section 18 of the Wildlife (Protection) act, 1972) dated September 27, 1979 (7,818.47 sq. km) and Notification No. WLP-1085/CR-588/VI/F-5 dated September 16, 1987 (677.97 sq. km). Most of the sanctuary was under cultivation and human habitation, thus it was not suitable for the Great Indian Bustard (*Ardeotis nigriceps*). Now it has been rationalized as per the recommendations of

the Sawarkar Committee constituted by the Government of Maharashtra (January 2007), for the rationalization. The area of the sanctuary was reduced to 1,222.61 sq. km. in 2012. In 2014, the sanctuary area was again decided to reduce to 366.66 sq. km by the Forest Department. This area includes grassland patches of Sringonda, Karjat, Newasa, North Solapur, Madha, Mohol and Karmala areas.

Within this notified area, the grassland plots where the Great Indian Bustard is regularly seen are identified as IBAs (For details about the Great Indian Bustard Sanctuary, see Rahmani 1989, Bharucha 1996).

IN-MH-06



BAIJU PATIL

The population of Great Indian Bustard *Ardeotis nigriceps* has recently crashed in Nannaj and its environs

From 1980, Nannaj and Karmala were selected for special conservation measures by the Forest Department for the protection of the Great Indian Bustard. While the bustard has almost become locally extinct in Karmala due to mismanagement of the habitat and known accidental electrocution of the last adult male (Patil *et al.* 2011b), it is still surviving in Nannaj in decreasing numbers, where it is being monitored for the last 32 years by BNHS and the Forest Department. This IBA site description mainly deals with Nannaj area.

The population of the Great Indian Bustard has recently crashed in Nannaj and its environs. During a bustard survey on July 17, 2005, only 22 bustards were sighted here and 27 bustards were sighted on July 16, 2006 (Census by Forest Department). About 14 bustards were sighted in Siddheshwar Vanvihar near Solapur in 2004 and 2005 but some birds must be moving between the two sites as they are not very far from each other. The population has crashed over the last 10 years, and during monsoon in 2013 only three bustards were sighted in Nannaj area.

#### Great Indian Bustard census figures during the last seven years:

[Source: Census Data, Pune Forest Department (Wildlife) Division]

Year	Numbers
2005	22
2006	27
2007	30
2008	24
2009	21
2010	09
2011	11
2012	13
2013	3
2014	3

Nannaj is a small village 20 km north of Solapur on the Solapur-Barshi road. The terrain is generally undulating, characteristic of the Deccan plateau. Rainfall is erratic and poorly distributed, with fluctuation over the years. The area around Nannaj can be broadly divided into plantation and grassland plots of the Drought Prone Areas Programme (DPAP) and District Rural Development Authority (DRDA), unprotected grazing land, and crop fields.

Important grasslands where the Great Indian Bustard is or was seen are: Nannaj plots, Mardi grazing land and grassland, Akolekati plantation and grassland, Vadala grazing land, Gangewadi plantation, Mohol grazing land and grassland, and Gangewadi grazing land. The natural vegetation of the sanctuary can be classified as Southern Tropical Thorn Forest (Champion & Seth 1968) and Tropical Grassland. However, the natural vegetation has more or less disappeared, and in the non-agricultural areas scrub and grasslands have taken over. Grasses such as *Sehima nervosum*, *Eremopogon foveolatus*, and *Cymbopogon martinii* dominate the area (Rahmani 1989). Recently, Gangewadi grassland (198.17 ha), where bustards are still seen, has been added to the sanctuary by the Forest Department (P. Patil, *pers. comm.* 2012). Gangewadi grassland was a known breeding site of bustards in the past (Rahmani 1989). Proper protection and restoration of Gangewadi grassland will provide another bustard breeding habitat.

#### AVIFAUNA

Nannaj is one of the crucial sites where the Critically Endangered Great Indian Bustard is surviving (Rahmani 1989, 1993). During the monsoon of 2003, six male and 17 female bustards were seen. In 2002–2003, seven juveniles were seen, indicating successful breeding (B. Habib, *pers.*

(comm. 2003). In 2009, the maximum number of GIB seen in a single flock was 10 (four males and six females). The population has declined in the past few years.

Historically, the Great Indian Bustard occupied a large range in the Indian subcontinent, mostly in dry areas. Once thought abundant throughout its range, currently the population of this species is considered very rare and apparently decreasing. GIB, locally called *Maldhok* in Maharashtra, was earlier seen mainly during the monsoon in the grassland plots of Nannaj and other areas (Rahmani & Manakadan 1986), but during the last 10 years they are seen throughout the year, though more birds are found during monsoon. They breed in the grassland plots of the sanctuary and the adjoining areas.

Apart from the GIB, about 134 bird species have been recorded, including the Painted Stork *Mycteria leucocephala*, White-necked Stork *Ciconia episcopus*, Black-winged Kite *Elanus caeruleus*, Long-legged Buzzard *Buteo rufinus*, White-eyed Buzzard *Butastur teesa*, Egyptian Vulture *Neophron percnopterus*, Black-headed or White Ibis *Threskiornis melanocephala*, Eurasian Spoonbill *Platalea leucorodia*, Greater Flamingo *Phoenicopterus roseus*, Ruddy Shelduck *Tadorna ferruginea*, Northern Pintail *Anas acuta*, Common Teal *A. crecca*, Spotbilled Duck *A. poecilorhyncha*, Gadwall *A. strepera*, and Great Horned Owl *Bubo bubo*. There are occasional records of the Lesser Florican *Sypheotides indicus* also (one chick of Lesser Florican was rescued by Forest Department at Karmala in 2006 (Bharat Cheda pers comm. 2006).

This IBA is also an important breeding ground for grassland species such as Indian Courser *Cursorius coromandelicus*, Yellow-wattled Lapwing *Vanellus malabaricus*, Chestnut-bellied Sandgrouse *Pterocles exustus*, Indian Bush-lark *Mirafra erythroptera*, Sykes's Crested Lark *Galerida deva*, and Ashy-crowned Finch-lark or Sparrow-lark *Eremopterix grisea*. In the monsoon, Rain Quail or Black-breasted Quail *Coturnix coromandelica* and Rock Bush-quail *Perdicula argoondah* breed in large numbers.

Nannaj has three communal roosts of wintering harriers, mainly the Montagu's *Circus pygargus*, Pallid or Pale *C. macrourus*, and the Pied Harrier *C. melanoleucus*. A maximum number of 200 harriers was seen roosting in 2006 (Kasambe & Mhaske 2011). One of the sites of Vadala area was seen destroyed due to a huge solar power plant constricted in 300 ha area (Narwade et al 2013a).

Red-headed Falcon *Falco chicquera* is regularly found hunting small birds, especially during the monsoon. Three species of bunting, namely Grey-necked Bunting *Emberiza buchanani*, Black-headed Bunting *Emberiza melanocephala*, and Red-headed Bunting *Emberiza bruniceps* are also seen during winter.

Breeding colonies of Painted were reported from Bale, 15 km from Nannaj and Donaj, Mangalvedha, 50 km from Nannaj while Woolly-necked Stork is known to breed from Ulegao village, 15 km from Nannaj (Narwade et al 2012a).

Though the GIB is surviving in Nannaj and its environs, it has disappeared from many other similar areas where it was common during the early 1980s, e.g., Mirajgaon, Mahi-



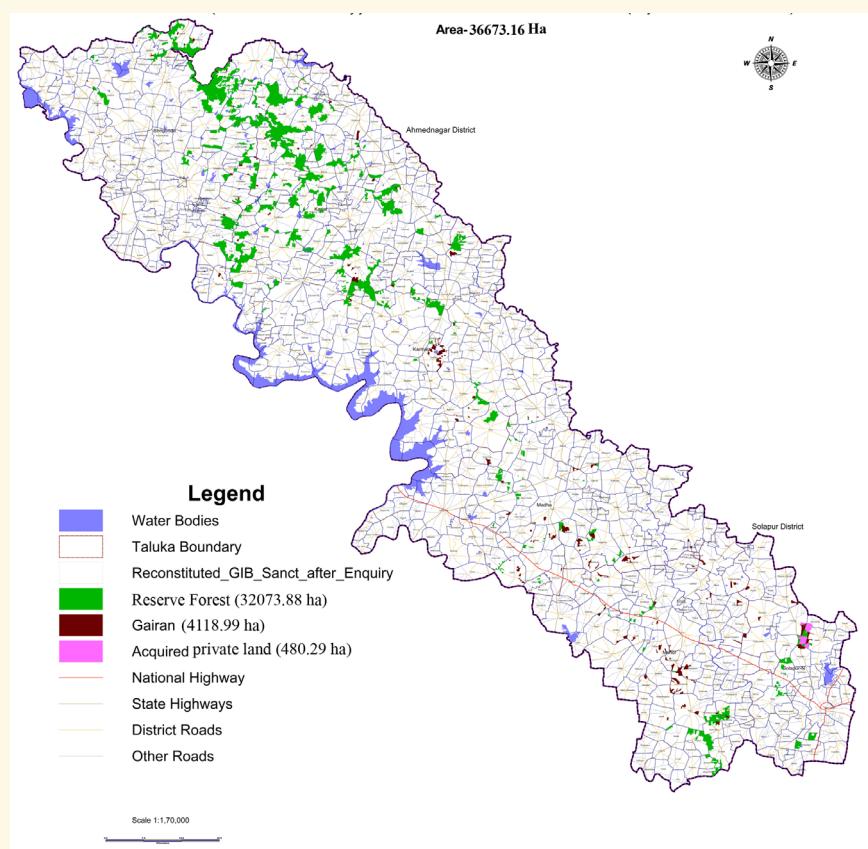
This IBA also supports good population of Blackbuck *Antilope cervicapra* and Indian Wolf *Canis lupus*

Jalgaon, Karmala, Karjat, and Deulgaon. This is mainly due to neglect, and failure to prevent overgrazing and other biotic disturbances. Despite being inside the Great Indian Bustard Sanctuary, many good grasslands which were foraging areas of the bustard were converted into industrial areas.

Recently, habitat restoration practices have been implemented by the Forest Department on an increasing scale, which have benefited the bustard to some extent (Patil 2010). The existing core areas have been protected by the massive scale Trench-cum-Mound (TCM), which is expected to reduce the disturbance caused by trespassing and illegal grazing (P. Patil, *pers. comm.* 2012).

Recently, a bustard-centric management plan has been prepared by the Forest Department for Gangewadi Bustard Sanctuary along with BNHS experts on line of bustard Species Recover Plan (Dutta *et al* 2013). A Task Force has been established for the monthly monitoring of conservation action under the guidance of the PCCF (WL). A committee is being established for the development of a management plan for a rationalized GIB sanctuary. A large scale community awareness campaign has been planned by the Forest Department along with BNHS (Pramod Patil *pers. comm.* 2014).

**Biodiversity of GIB area, Solapur** A one year biodiversity study carried out by the BNHS (Narwade *et al* 2012) at proposed Solapur Super Thermal Power Project,



Map of reconstituted GIB Sanctuary (Showing 36673.15 Ha area as released by Forest Department in 2015)

CRITICALLY ENDANGERED	
Red-headed Vulture	<i>Aegypius calvus</i>
Great Indian Bustard	<i>Ardeotis nigriceps</i>
ENDANGERED	
Egyptian Vulture	<i>Neophron percnopterus</i>
Lesser Florican	<i>Syphoictes indicus</i>
VULNERABLE	
Asian Woollyneck	<i>Ciconia episcopus</i>
NEAR THREATENED	
Painted Stork	<i>Mycteria leucocephala</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Pallid Harrier	<i>Circus macrourus</i>
Laggar Falcon	<i>Falco jugger</i>
Red-headed Falcon	<i>Falco chicquera</i>
River Tern	<i>Sterna aurantia</i>
European Roller	<i>Coracias garrulus</i>

NTPC, Ltd. which is located at 30 km from Nannaj, a core area of GIB Sanctuary, Solapur revealed the presence of 205 plant species, 130 species of insect, 43 families of spiders, 41 species of fish, 7 species of amphibians, 15 species of reptiles, 149 species of birds, 15 species of mammals. The study was conducted in 300 sq km area during December 2011 to November 2012. In adjoining district of Osmanabad about 165 species of birds were recorded in during March 2007 to July 2008 (Narwade and Fartade, 2010). Total 11 bat species were reported from South-West region Deccan plateau of Maharashtra (Gaikwad *et al* 2012).

#### OTHER KEY FAUNA

Nannaj has a resident pack of Indian or Grey Wolf *Canis lupus* (Kumar & Rahmani 1997). Occasionally, up to 12 wolves, including juveniles are seen. Their main natural prey is the Blackbuck *Antelope cervicapra*, but there are instances when they kill bustards. Indian Fox *Vulpes bengalensis* and Golden Jackal *Canis aureus* are the other two predators. Both are dangerous to bustard eggs and unfledged chicks. Chinkara *Gazella bennettii* is present in Karmala and other parts of the sanctuary, but is not reported in Nannaj. Common reptiles such as Fan-throated Lizard *Sitana ponticeriana* of the Deccan are also found here.

During recently conducted surveys of harriers in deccan plateau of Maharashtra out of 14 selected grasslands of more than 300 ha area it was found that except patches of protected areas of all the grasslands are under tremendous pressure of developmental projects such

as power plants of solar, thermal proposed industrialization such as cement and sugar factories (Narwade *et al.* 2013a). Now bustards are facing new threat from upcoming renewable energy power plants in grasslands near bustard areas (Narwade *et al* 2013b.)

### THREATS AND CONSERVATION ISSUES

- a. Because of change in land use pattern for various developmental projects potential grasslands are getting fragmented.
- b. Expansion of agriculture is leading to shrinking of grassland habitat in bustard areas
- c. Rampant use of pesticides may be affecting the entire food chain of the Great Indian Bustard which needs to be studied in detail.
- d. Overgrazing outside the grassland plots of the Forest Department may lead to trampling of eggs of ground nesting birds
- e. Poaching – Hunting of Black-naped Hare *Lepus nigricollis*, Grey Francolin *Francolinus pondicerianus*, quails and Blackbuck *Antilope cervicapra* is common practice in bustard area as it is difficult to keep watch on these landscape species in human dominated landscape. Destruction of bustard habitats by various plantation schemes on grassland areas.
- f. Lack of public support for conservation (Patil *et al.* 2011a) because of no proper policies for conservation of landscape species.
- g. Disturbance to breeding bustards by stray dogs (Patil & Chindarkar 2012)
- h. The Great Indian Bustard uses an extensive landscape for foraging, nesting, and movement. There is an urgent need to study its ranging pattern through satellite tracking and colour marking to determine its movement and breeding success.
- i. Community-based conservation plays a key role in the conservation of bustards. Currently, there is lack of community support to bustard conservation as mentioned above (P. Patil, *pers. comm.* 2012). For the long-term conservation of bustard, involvement of the community through various programmes is needed.

### KEY CONTRIBUTORS

A.R. Rahmani, R. Manakadan, Pramod Patil, Sujit Narwade, Raju Kasambe.

### KEY REFERENCES

Bharucha, E.K. (1996) Evolving a rational strategy for an integrated protected area system in Maharashtra. *JBNHS* 93: 513–554.

Champion, H.G. and Seth, S.K. (1968) *A Revised Survey of the Forest Types of India*. Govt. of India Press, Delhi. Pp. 403.

Dutta, S., Rahmani, A., Gautam, P., Kasambe, R., Narwade, S., Narayan, G., and Jhala, Y. (2013) Guidelines for Preparation of State Action Plan for Resident Bustards' Recovery Programme. Submitted to the Ministry of Environment and Forests, Government of India. New Delhi.

Gaikwad, M.C., Narwade, S.S., Fartade, K.M. and Korad, V.S. (2012) A review of distribution of Bats in South-Western region of deccan Maharashtra, India and conservation recommendations. *Taprobanica* 4 (1): 27-36.

Kasambe, R. and Mhaske, B. (2011) Report on three new harrier roosts in Bustard Sanctuary, Maharashtra. *Newsletter for Birdwatchers* 51(3): 38–39.

Kasambe, R., Pimplapure, A., Thosar, G. and Shad, M.S.R. (2007) Sighting records of Great Indian Bustard (*Ardeotis nigriceps*) in Vidarbha. *Newsletter for Birdwatchers* 46(6): 88–89.

Kumar, S. and Rahmani, A.R. (1997) Status of Indian Grey Wolf *Canis lupus pallipes* and its conservation in marginal agricultural areas of Solapur district, Maharashtra. *JBNHS* 94(3): 466–472.

Narwade, S.S. & Fartade, M.M. (2010) A note on birds of Osmanabad district of Maharashtra, India. *Journal of Threatened Taxa* 3(2): 1567-1576.

Narwade, S.S., Gaikwad, M.C. and Fartade, K.M., Fugare, R. and Rahmani, A.R. (2012a) Distribution and conservation of heronries in region of deccan Maharashtra, India. *The Journal of Care4Nature* 1(1): 11-17.

Narwade, S.S., R.V. Khot, S.B. Bajaru, D.N. Varier, M. Prabhu, P.A. Shaikh, R.B. Fugare, R.V. Hippargi, K.M. Fartade & A.R. Rahmani (2012b): Study of Flora and Fauna Solapur Super Critical Thermal Power Plant (SoSTPP), National Thermal Power Corporation (NTPC), Solapur. Submitted by BNHS, India. Pp. 113.

Narwade, S.S., Gaikwad, M.C. and Fartade, K.M. (2013a): Status survey of harriers in south-western region of deccan plateau of Maharashtra. *Newsletter for Bird Watchers* 53(2): 28-30.

Narwade, S.S., Shaikh, P.A., Prabhu, M.V. and Rahmani, A.R. (2013b): Review of existing global guidelines, policies, and methodologies for the study of impact of wind mills on birds and bats: requirements in India. *BUCEROS* 8(1&2): 1-48.

Patil, P. (2010) Recent habitat management at Great Indian Bustard Sanctuary, Solapur, Maharashtra: A welcome sign for bustards. *Mistnet* 11(1): 4–5.

Patil, P. and Chindarkar, P. (2012) Stray dogs a threat to Great Indian Bustard in Bustard Sanctuary, Maharashtra. *Mistnet* 13(1): 9–10.

Patil, P., Rao, M.K. and Adkar, R.K. (2011a) Community involvement in Bustard conservation in Maharashtra. *Mistnet* 12(4): 4–6.

Patil, P., Chindarkar, P. and More, S. (2011b) Collision with power lines: a threat to Great Indian Bustard in Bustard Sanctuary, Maharashtra. *Mistnet* 12(4): 7–8.

Rahmani, A.R. (1989) The Great Indian Bustard. Final Report. Bombay Natural History Society, Bombay. Pp. 234.

Rahmani, A.R. (1993) Project Bustard: Last Chance to Save the Great Indian Bustard. In: Verghese, A., Sridhar, S. and Chakravarthy, A.K. (eds) *Bird Conservation – Strategies for the Nineties and Beyond*. Ornithological Society of India, Bangalore. Pp. 73–75.

Rahmani, A.R. and Manakadan, R. (1986) Movement and flock composition of the Great Indian Bustard *Ardeotis nigriceps* (Vigors) at Nannaj, Solapur District, Maharashtra, India. *JBNHS* 83: 17–30.

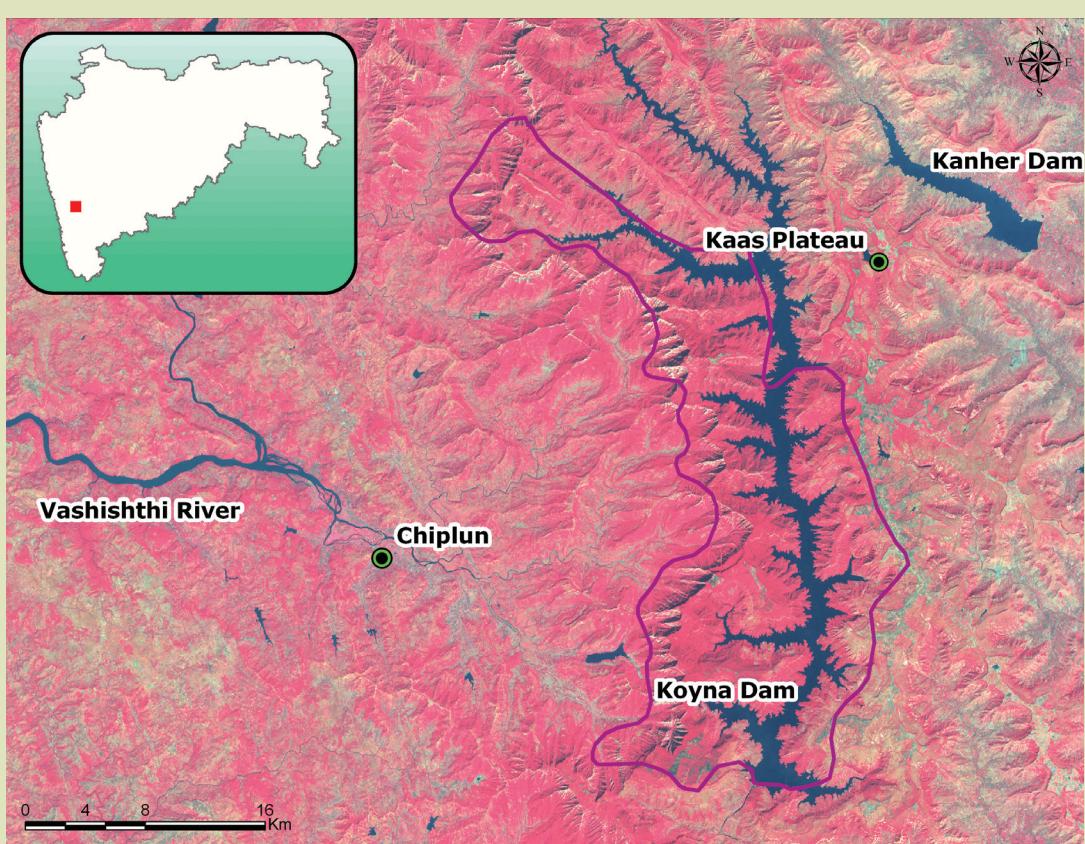
## KOYNA WILDLIFE SANCTUARY

<b>IBA Site Code</b>	: IN-MH-07
<b>District</b>	: Satara
<b>Coordinates</b>	: 17° 38' 26" N, 73° 42' 31" E
<b>Ownership</b>	: State
<b>Area</b>	: 42,355 ha

<b>Altitude</b>	: 1,800 msl
<b>Rainfall</b>	: 2,500–3,000 mm
<b>Temperature</b>	: 6 °C to 37 °C
<b>Biogeographic Zone</b>	: Western Ghats
<b>Habitats</b>	: Tropical Dry Evergreen Forest, Tropical Moist Deciduous Forest

**IBA CRITERIA:** A1 (Threatened Species), A2 (Endemic Bird Area 123 Western Ghats)

**PROTECTION STATUS :** Wildlife Sanctuary, established in 1985. Recently included in the Sahyadri Tiger Reserve (STR) along with Chandoli National Park vide government notification dated 5 January 2010.



### GENERAL DESCRIPTION

Koyna Wildlife Sanctuary is located in the *tehsils* of Jawali and Patan in Satara district, western Maharashtra, covering an area of 42,355 ha and extending westwards till Ratnagiri district. Koyna WLS includes the eastern and western catchments of Koyna Dam, a major hydroelectric project in western Maharashtra, currently generating 2,200 MW. The reservoir of the dam is known as Shivasagar. The sanctuary is well protected to a large extent by the Shivasagar reservoir and steep slopes. Chandoli corridor connects the sanctuary to Radhanagari Wildlife Sanctuary to the south (Pande 2005).

At the centre of the sanctuary lies the historical Vasota fort, constructed during 1178–1193, which was taken over by the great Maratha warrior Chhatrapati Shivaji in 1655 and used as a prison. During the Peshwa regime in 1817, the fort was taken by the British after an intense battle, which resulted in its destruction. Now only ruins of the fort remain.

The vegetation consists of Southern Tropical Evergreen Forest and Southern Moist Mixed Deciduous Forest, according to the classification of Champion & Seth (1968). The sanctuary hosts the threatened tree species *Narkya Mappia foetida*, *Euphorbia longana* and *Elaeocarpus*

*tectorius* are other uncommon species found here. Giant trees such as *Harpullia arborea* and *Turpinia malabarica*, endemic to the Western Ghats, are commonly found in this IBA.

## AVIFAUNA

No systematic study of the avifauna of Koyna WLS has been done, though the area is rich in avifauna and other biodiversity. A decade ago, BNHS had undertaken an EIA project in the area and 61 bird species were reported from a small part of the sanctuary. Indian Blue Robin *Luscinia brunnea*, a Himalayan bird, was seen in this IBA site (A. Akhtar, *pers. comm.* 2003). This is a Biome 7 (Sino-Himalayan Temperate Forest) species. During winter, it is seen in Sri Lanka, hills of the Northeast and southern Western Ghats (Ali & Ripley 1987, Grimmett *et al.* 2011). This IBA once had undisturbed forests typical of Western Ghats (EBA 123), but now forest fires and encroachments have become common on the northern periphery, especially near Tapola and Bamnoli villages. Two restricted-range species have been seen, but more research is needed to know the full extent of the avian diversity of this IBA.

## OTHER KEY FAUNA

Large mammals found in the Koyna Sanctuary are Tiger *Panthera tigris*, Leopard *P. pardus*, Gaur *Bos frontalis*, Indian Wild Dog *Cuon alpinus*, Sloth Bear *Melursus ursinus*, Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak*, Mouse Deer *Moschiola meminna*, Indian Giant Squirrel *Ratufa indica*, Common Otter *Lutra lutra* (doubtful record), and Common Langur *Semnopithecus entellus*. Reptiles such as the Indian Python *Python molurus*, Beddome's Keelback *Amphiesma beddomei*, Indian Chameleon *Chamaeleon*



Indian Blue Robin *Luscinia brunnea* has been reported from Koyna

## CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>

## VULNERABLE

Asian Woollyneck	<i>Ciconia episcopus</i>
Indian Spotted Eagle	<i>Clanga hastata</i>
Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>

## NEAR THREATENED

River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

## ENDEMIC BIRD AREA 123: WESTERN GHATS

Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>
Malabar Parakeet	<i>Psittacula columbooides</i>
Malabar Grey Hornbill	<i>Ocyceros griseus</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Small Sunbird	<i>Leptocoma minima</i>

## BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST

Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Malabar Whistling-thrush	<i>Myophonus horsfieldii</i>
Indian Scimitar-babbler	<i>Pomatorhinus horsfieldii</i>
Loten's Sunbird	<i>Cinnyris lotenius</i>

## BIOME 11: INDO-MALAYAN TROPICAL DRY ZONE

Jungle Bush-quail	<i>Perdicula asiatica</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Black-rumped Flameback	<i>Dinopium benghalense</i>
Malabar Lark	<i>Galerida malabarica</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Rufous-bellied Babbler	<i>Dumetia hyperythra</i>
Ashy Prinia	<i>Prinia socialis</i>
Jungle Prinia	<i>Prinia sylvatica</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>

*zeylanicus*, Banded Gecko *Geckoella deccanensis*, and Dwarf Gecko *Cnemaspis* sp. are also found.

A unique endemic species of amphibian, the Koyna Toad *Bufo koynensis*, is reported from the sanctuary, which is the type locality of this species. Other endemic amphibians, such as the caecilian *Indotyphlus* sp., Wrinkled Frog *Nyctibatrachus* sp., and the Bombay Bush Frog *Philautus bombayensis* are also reported (Varad Giri, *pers. comm.* 2012).

## LAND USE

- Nature conservation
- Agriculture
- Hydroelectric project
- Windmills



NIRANJAN SANT

Oriental Dwarf Kingfisher *Ceyx erithaca* breeds in Koyna

## THREATS AND CONSERVATION ISSUES

- Dam construction
- Hydroelectric project
- Poaching
- Overcollection of medicinal plants
- Tourism
- Encroachments
- Forest fires

The major threat to this IBA comes from the proposed Humbarli Pumped Storage Scheme (400 MW), as about 25 ha of pristine forest will be submerged by it. This IBA is a honeycomb of privately-owned forests and patches of agricultural land. The area at the periphery of the sanctuary is being actively promoted as a tourism zone by the Government of Maharashtra. This will create serious environmental problems in the form of increased tourist traffic, water pollution, littering of non-degradable waste, and general disturbance.

Koyna is a well-known trekking location. Aggressive promotion of tourism in this area will increase garbage and noise pollution. The topography of the sanctuary is conducive to high velocity wind, and therefore likely

to be considered for exploitation of non-conventional energy. The windmills that dot the landscape are at present away from the boundary of the sanctuary, but are likely to come up inside also. The area is rich in medicinal plants that were sustainably used by the tribal community Dunge-dhangar. However, pharmaceutical companies are now increasingly exploiting this limited resource.

## KEY CONTRIBUTORS

Girish Jathar, Varad Giri, Asad Akhtar, Rohan Bhate

## KEY REFERENCES

Ali, S. and Ripley, S.D. (1987) *Compact Handbook of the Birds of India and Pakistan*, 2nd edn. Oxford University Press, Delhi. Pp.816.

Champion, H.G. and Seth, S.K. (1968) *A Revised Survey of Forest Types of India*. Govt. of India Press, Delhi. Pp.403.

Grimmett, R., Inskip, C. and Inskip, T. (2011) *Birds of the Indian Subcontinent*. Christopher Helm (Publishers) Ltd., London. Pp.528.

Pande, P. (2005) *National Parks and Sanctuaries in Maharashtra. Reference Guide: Volume II Individual Profile and Management Status*. Bombay Natural History Society, Mumbai. Pp. 531.

## MAHUL SEWRI MUDFLATS

**IBA Site Code** : IN-MH-08

**District** : Mumbai

**Coordinates** : 19° 01' 00" N, 72° 52' 60" E

**Ownership** : Mumbai Port Trust, BARC, BPCL

**Area** : c. 10 km x 3 km

**Altitude** : 0 msl

**Rainfall** : 2,300 mm

**Temperature** : 13 °C to 39 °C

**Biogeographic Zone** : Coasts

**Habitats** : Littoral Forest (Mangroves), Mudflats

**IBA CRITERIA** : A1 (Threatened Species), A4i (>1% biogeographic population), A4iii (>20,000 waterbirds)

**PROTECTION STATUS** : Not officially protected.



### GENERAL DESCRIPTION

The open mudflats of Mahul, Trombay, and Sewri are located along the Arabian Sea. An area c. 10 km long and 3 km wide is dominated by mangroves all along the coast. The area is prohibited to the general public. The jetty of Mumbai Port Trust (MbPT), Bhabha Atomic Research Centre (BARC), and Tata Electrical Co. are located along the area. There are refineries of Oil and Natural Gas Commission (ONGC), Bharat Petroleum Corporation Limited (BPCL), and Hindustan Petroleum Corporation Limited (HPCL) in the vicinity.

Despite the high degree of pollution, the area is a winter refuge for thousands of migratory birds from as far as the

Arctic Circle. They include sandpipers, plovers, stints, gulls, and terns. The area also supports a large congregation of flamingos which are local migrants, probably from Gujarat. Raptors also use the area as a stopover and a few of them winter here, such as the Eurasian Marsh Harrier *Circus aeruginosus* and the Greater Spotted Eagle *Aquila clanga*.

Mahul-Sewree mudflats have been proposed as a Ramsar Site in India as they meet Ramsar Criteria 2 (wetland supports threatened ecological communities), Criteria 4 (wetland provides refuge during adverse conditions to threatened species), Criteria 5 (wetland regularly supports 20,000 or more waterbirds), and Criteria 6 (wetland

IN-MH-08



NOOR KHAN

Thousands of Lesser Flamingos and other waders congregate at Sewri Mudflats for nearly six months of the year

regularly supports 1% of the individuals in a population of one species or subspecies), and for the area's high ecological value (Islam & Rahmani 2008).

The site is dominated by mangrove vegetation and supports diverse flora. Fifty-three species of vascular plants have been recorded. Of these 10 species are mangroves and 13 are mangrove-associated species. *Avicennia marina* is the dominant plant, while *Rhizophora mucronata* and *Excoecaria agallocha* also occur.

## AVIFAUNA

Till now about 150 bird species have been identified from this IBA. Along the mudflats in Sewri, 1,500–2,000 Greater Flamingo *Phoenicopterus roseus*, 15,000 Lesser Flamingo *Phoeniconaias minor*, and 7,000 Lesser Sand Plover *Charadrius mongolus* were sighted in January 2003. Globally Threatened species such as the Spotted Greenshank *Tringa guttifer*, Greater Spotted Eagle *Aquila clanga*, Eastern Imperial Eagle *A. heliaca* (Verma 2004, Verma *et al.* 2004), and White-rumped Vulture *Gyps bengalensis* are seen here. However, sighting of Spotted Greenshank in Sewri needs further confirmation as there is no record of this species from the western coast of India (Rahmani 2012). Verma *et al.* (2004) have also listed the Critically Endangered Spoon-billed Sandpiper *Eurynorhynchus pygmeus* in the checklist of birds of this IBA, which needs further confirmation as the species has not been sighted anywhere along the western coast of India.

Other bird species include the Little Green Heron *Butorides striatus*, Western Reef Heron *Egretta gularis*, Black-headed

### CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>

### ENDANGERED

Spotted Greenshank (?)	<i>Tringa guttifer</i>
------------------------	------------------------

### VULNERABLE

Greater Spotted Eagle	<i>Clanga clanga</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>

### NEAR THREATENED

Painted Stork	<i>Mycteria leucocephala</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Lesser Flamingo	<i>Phoeniconaias minor</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
River Tern	<i>Sterna aurantia</i>

Ibis *Threskiornis melanocephalus*, Common Redshank *Tringa totanus*, Marsh Sandpiper *T. stagnatilis*, Common Greenshank *T. nebularia*, Curlew Sandpiper *Calidris ferruginea*, Brown-headed Gull *Larus brunnicephalus*, Whiskered Tern *Chlidonias hybridus*, Gull-billed Tern *Gelochelidon nilotica*, Caspian Tern *Sterna caspia*, Little Tern *S. albifrons*, and Western Marsh Harrier *Circus aeruginosus*. The site holds more than 1% of the global population of Temmink's Stint *Calidris temmincki* (Islam & Khan 2011).

Huge flocks of stints *Calidris* spp., sometimes 8,000–10,000 are seen, even to the end of May. It should be noted that many of these numbers are much above the 1% threshold of biogeographic population determined by Wetlands International (2006). This site easily fulfils

Criteria A4i (=1% of biogeographic population) and A4iii (>20,000 waterbirds).

A table showing estimates of Lesser Flamingo population seen in the IBA is given below.

Table: Estimates of Lesser Flamingo at Mahul-Sewree mudflats in Mumbai area (source: Raju Kasambe)

Sr. No.	Date	Count
1	January 22, 2011	5,000
2	March 27, 2011	9,000–10,000
3	December 9, 2011	325
4	February 11, 2012	10,000
5	February 26, 2012	10,000
6	March 16, 2012	12,000
7	November 27, 2012	15,000
8	December 1, 2012	15,000
9	February 13, 2013	5,000
10	March 26, 2013	15,000
11	May 10, 2013	7,000
12	November 11, 2013	5,000
13	December 19, 2013	8,000
14	January 17, 2014	20,000
15	March 01, 2014	15,000
16	March 29, 2014	15,000

### OTHER KEY FAUNA

The only large mammal recorded in this marshland was a Golden Jackal *Canis aureus* (Verma *et al.* 2004). Other fauna includes eight reptiles, 28 species of butterflies, eight species of gastropods, five species of bivalves, two species of pulmonates, and nine species of crustaceans.

### LAND USE

- Industrial area
- Saltpans
- Shipyard
- Oil refineries

### THREATS AND CONSERVATION ISSUES

- Encroachment by slums
- Chemical pollution (chemicals, oil, grease, pesticides)
- Release of untreated sewage into the sea
- Release of dye wastes
- Fish mortality due to hot water discharge into the sea
- Overexploitation of fishery
- Poaching of birds
- Fuel wood collection from mangroves
- Electrocution of flamingos on high tension wires

The Government of Maharashtra has proposed the construction of the Mumbai Trans Harbour Link through the Sewri mudflats which will connect mainland Mumbai to Nhava Sheva. But the bridge will eventually destroy the mudflats of Sewri as it will pass right through the mudflats. BNHS has proposed realigning the bridge to save the IBA (Kasambe 2011).

Seepage of industrial effluents into the mangroves and creek is an issue of concern, as untreated waste is causing contamination of the water. ONGC, BPCL, and HPCL release their effluents into these mudflats. Rashtriya Chemicals and Fertilizers, which is situated about 5 km from this creek, also releases its wastes here. Besides, the sewage of the metropolis is being released here. A dye factory that is situated nearby also pours its effluents into the area. This ultimately affects the prey base of birds. Local slum dwellers are dependent on the mangroves for fuel wood. Rapidly increasing slum colonies are placing a great burden on the limited resources of this ecosystem. There are cases of electrocution of flamingos due to high tension wires.

BPCL and Mumbai Port Trust are carrying out awareness campaigns and conservation related activities in this area



Thousands of people throng to Sewri Jetty to witness the panorama of the pink beauties - Flamingos



RAJKASAMBE

BNHS organizes a Flamingo Festival every year at this IBA

with the help of BNHS. BNHS has been organizing an annual Flamingo Festival here for the last few years. Thousands of people visit Sewree Jetty to experience the sight of thousands of flamingos foraging in the mudflats. Rastogi *et al.* (2005) had suggested that the government should be convinced to realign the proposed bridge (Mumbai Trans Harbour Link) up to 800 m southwards of its present position in order to save the main feeding areas of the flamingos.

In 2013, the Forest Department had announced six sites were identified to be declared as Ramsar Sites. They are Sewri Creek (Mumbai district), Ujjani Reservoir (Pune district), Jaikwadi Bird Sanctuary (Aurangabad district), Navegaon Bandh Reservoir (Gondia district), Nandur Madhmeshwar Wildlife Sanctuary (Nashik district), and Lonar Crater Wildlife Sanctuary (Buldhana district) (<http://www.downtoearth.org.in/news/maharashtra-to-propose-five-wetland-sites-for-recognition-as-ramsar-sites-40159> as accessed on 05 September 2015). However, nothing has happened till date.

#### KEY CONTRIBUTORS

T.V. Sowrirajan, S. Balachandran, Ashok Verma,  
Isaac Kehimkar, Vivek Kulkarni, Raju Kasambe

#### KEY REFERENCES

- Islam, M.Z. and Khan, N.I. (2011) Large congregations of Stints at Sewri-Mahul Mudflats (IBA), in Metropolitan Mumbai, India. *Mistnet* 12(4): 9–11.
- Islam, M.Z. and Rahmani, A.R. (2008) *Potential and Existing Ramsar Sites in India*. Indian Bird Conservation Network, BNHS, BirdLife International and Royal Society for the Protection of Birds, UK. Oxford University Press. Pp. 592.
- Kasambe, R. (2011) Meeting for deliberations on Trans-Harbour Link, Mumbai. *Mistnet* 12(4): 13.
- Rahmani, A.R. (2012) *Threatened Birds of India – Their Conservation Requirements*. IBCN, BNHS, RSPB, and BirdLife International. Oxford University Press. Pp. xvi + 864.
- Rastogi, A., Islam, Z., and Jathar, G. (2005) Fire on the water... smoke in the sky. *Mistnet* 6(4): 4–8.
- Verma, A. (2004) Sighting of Eastern Imperial Eagle *Aquila heliaca* from Mumbai, Maharashtra. *JBNHS* 101(2): 314.
- Verma, A., Balachandran, S., Chaturvedi, N. and Patil V. (2004) A preliminary report on the biodiversity of Mahul Creek, Mumbai, India with special reference to avifauna. *Zoos' Print Journal* 19(9): 1599–1605.
- Wetlands International (2006) *Waterbird Population Estimates – Fourth Edition*. Wetlands International, Wageningen, The Netherlands. Pp. 239.

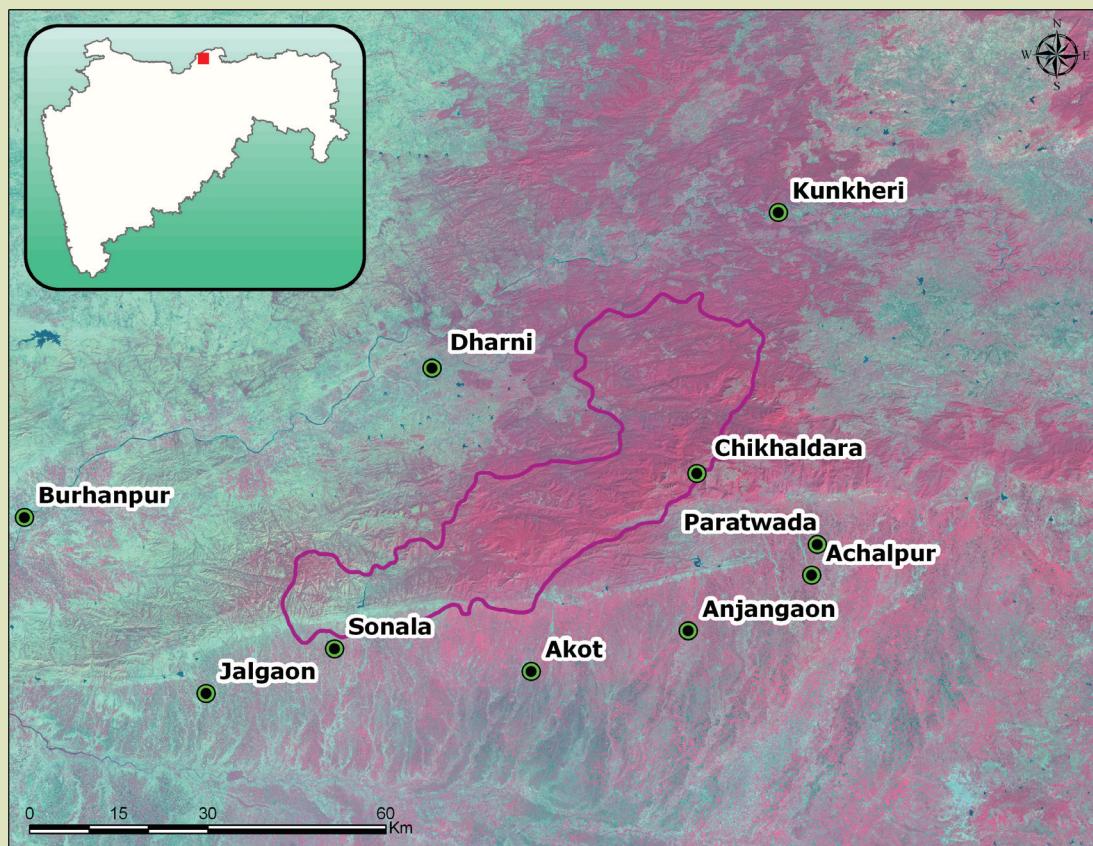
## MELGHAT TIGER RESERVE

<b>IBA Site Code</b>	: IN-MH-09
<b>District</b>	: Amravati
<b>Coordinates</b>	: 21° 28' 16" N, 77° 00' 06" E
<b>Ownership</b>	: State
<b>Area</b>	: 202,904 ha

<b>Altitude</b>	: 312–1,178 msl
<b>Rainfall</b>	: 1,500–2,200 mm
<b>Temperature</b>	: 6 °C to 45 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula
<b>Habitats</b>	: Tropical Dry Deciduous Forest, Tropical Grassland

**IBA CRITERIA** : A1 (Threatened Species), A2 (Secondary Area s075: Central Indian Forests),  
A3 (Biome 11: Indo-Malayan Tropical Dry Zone)

**PROTECTION STATUS** : Wildlife Sanctuary, established in 1985. Notified at Tiger Reserve 1994 including Gugamal National Park (core area), Melghat Wildlife Sanctuary (the buffer area) and Wan, Narnala, and Ambabarwa Wildlife Sanctuaries.

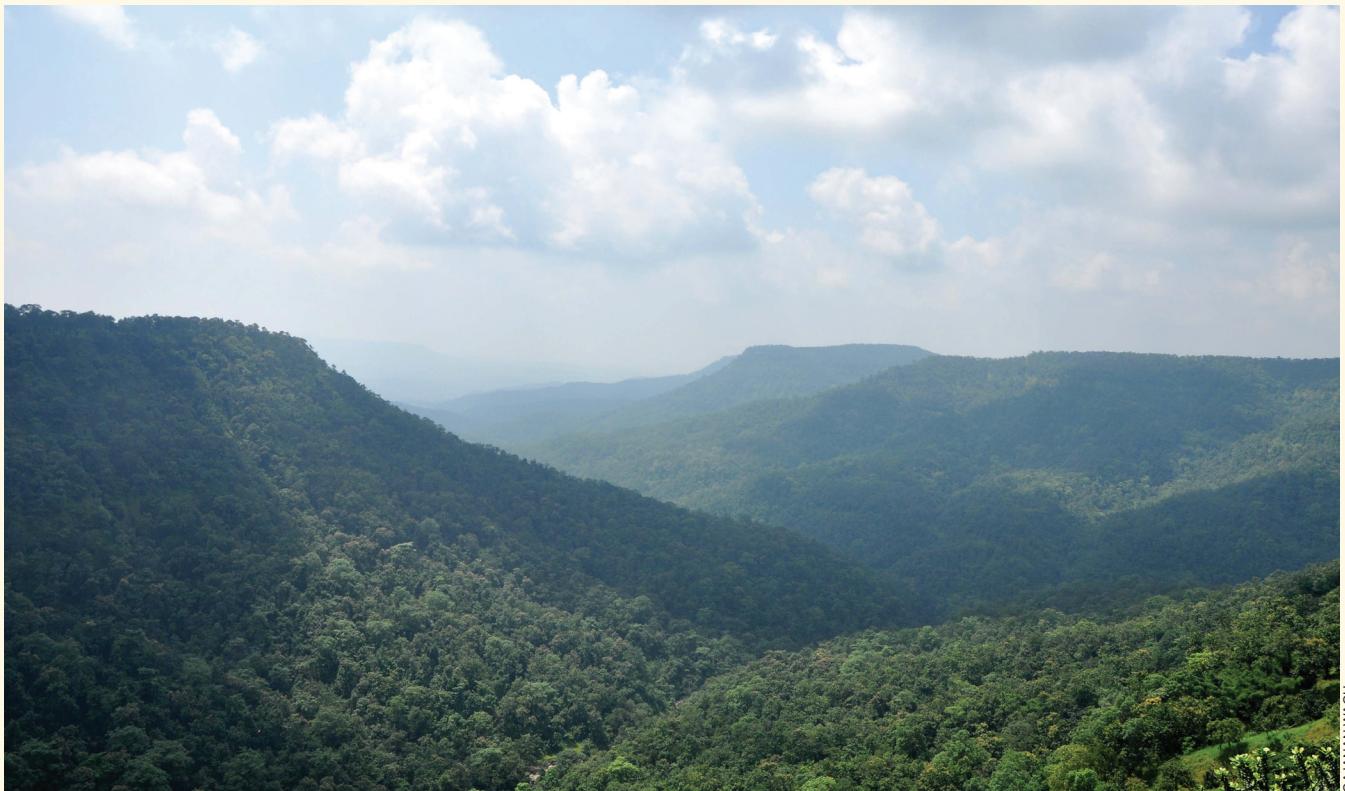


### GENERAL DESCRIPTION

Melghat Wildlife Sanctuary and Tiger Reserve lies at the northern extreme of Amravati district in Maharashtra along the Madhya Pradesh border. It is situated on a southern offshoot of the Satpura range. The name Melghat means the place where the ghats (hills) meet. The core area (36,128 ha) is formed by the Gugamal National Park, and the buffer area (78,828 ha) by the Melghat Wildlife Sanctuary. These were together re-notified by the state government in 1994 as the Melghat Tiger Reserve (MTR). MTR now also includes three wildlife sanctuaries, namely Wan, Narnala, and

Ambabarwa. The remaining area (52,693 ha) is managed as a multiple-use area. Variat Devi Point in Chikaldhara Plateau is at 1,178 msl, the highest point in Melghat.

The vegetation is mainly Southern Tropical Dry Deciduous Forest. Besides, there are grassy meadows throughout the reserve, especially on the hilltops. Melghat Tiger Reserve covers the rugged terrain of the Gavilgarh Hills, which are part of the Satpuras. Topographically, it consists of a succession of hills and valleys. The main ridge, called Gavilgarh Ridge, runs east-west on the southern part of the reserve. It is a plateau on top, descending in abrupt



GAJANAN WAGH

Melghat means a place where the ghats meet: it has many hills and valleys

and sharp precipitous scarps on both sides and then steep slopes down to narrow valleys. The plateau was earlier used for agriculture. Sudden variations in altitude, aspect, and gradient are seen throughout the reserve.

MTR is a catchment area for five major streams, all of which are tributaries of River Tapti. The forest type is Tropical Dry Deciduous, dominated by Teak *Tectona grandis* and Bamboo *Bambusa* spp. There are patches of Semi-evergreen and Moist Deciduous Forests. Teak was planted in a large area clear-felled for this purpose. There are many species of orchids, ferns, grasses, and other herbs. The common epiphytic orchids are *Aerides*, *Rhynchostylis*, and *Vanda*. *Ceropegia odorata*, an extremely rare species, is found in this area.

## AVIFAUNA

Savarkar (1987) had listed 252 species of birds from this IBA. An important old record is of Fairy Bluebird *Irena puella* and recent records include Great Black Woodpecker *Dryocopus javensis*, Stork-billed Kingfisher *Halcyon capensis*, and Black-capped Kingfisher *H. pileata* (Kothari 1998). Mahabal (2005) also studied the avifauna of Melghat. A Yellow-rumped Flycatcher *Ficedula zanthopygia* was sighted here in 1989 (Haribal 1991). Kasambe (2002) added four more species to the Melghat bird list: Little Green Heron *Butorides striatus*, Black-crowned Night Heron *Nycticorax nycticorax*, Sparrow-Hawk *Accipiter nisus*, and Crested Bunting *Melophus lathami*. A small breeding population of the Malabar Pied Hornbill *Anthracoboceros coronatus* was

reported (Kasambe & Wadatk 2006). Another 11 species have been sighted recently in Melghat (Wadatk *et al.* 2012), including a Cinereous Vulture *Aegypius monachus*. Jathar (2008) reported the occurrence of Oriental Scops-owl *Otus sunia sunia* in Melghat. Kasambe *et al.* (2005b) described the last few sightings of Long-billed Vulture *Gyps indicus* in Melghat.

However, the star bird of this tiger reserve is the Forest Owl *Heteroglaux blewetti*. During a BNHS study in 2000, to gather information on the status and distribution of the Forest Owl in India, one bird was sighted (Ishtiaq & Rahmani 2000). Later, K. Rithe and P.M. Lad saw 4–5 pairs (Rithe 2003). In another survey in 2004, Jathar & Rahmani (2004) estimated a total population of c. 74 birds, which included 25 pairs along with 24 fledglings at Melghat and the adjoining forests of Betul and Burhanpur districts in Madhya Pradesh. Now Melghat is considered to be the stronghold of the Forest Owl, of which nearly 100 birds are reported (Kasambe *et al.* 2005a), and is believed to be safer than the Forest Owl's other known locations.

Melghat is one of the best areas to see avian species of the Indo-Malayan Tropical Dry Zone (Biome 11). Of the 59 species identified by BirdLife International (undated), 44 have been seen here till now.

Melghat Tiger Reserve is one of the few sites in India that come under the Secondary Area category of BirdLife International (undated) and Stattersfield *et al.* (1998). Secondary area is an area which supports one or more restricted-range species, but does not qualify as an Endemic

**CRITICALLY ENDANGERED**

White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Red-headed Vulture	<i>Aegypius calvus</i>
Forest Owlet	<i>Heteroglaux blewitti</i>

**VULNERABLE**

Asian Woollyneck	<i>Ciconia episcopus</i>
Green Munia	<i>Amandava formosa</i>

**NEAR THREATENED**

Painted Stork	<i>Mycteria leucocephala</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Red-headed Falcon	<i>Falco chicquera</i>
River Lapwing	<i>Vanellus duvaucelii</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Malabar Pied Hornbill	<i>Anthracoboceros coronatus</i>

**SECONDARY AREA S075**

Forest Owlet	<i>Heteroglaux blewitti</i>
--------------	-----------------------------

**BIOME 11: INDO-MALAYAN TROPICAL DRY ZONE**

Red-naped (Black) Ibis	<i>Pseudibis papillosa</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Painted Francolin	<i>Francolinus pictus</i>
Rain Quail	<i>Coturnix coromandelica</i>
Jungle Bush-quail	<i>Perdicula asiatica</i>
Indian Peafowl	<i>Pavo cristatus</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Indian Courser	<i>Cursorius coromandelicus</i>
Yellow-legged Green-pigeon	<i>Treron phoenicopterus</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocypterus birostris</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahrattensis</i>
Black-rumped Flameback	<i>Dinopium benghalensis</i>
White-naped Woodpecker	<i>Chrysocolaptes festivus</i>
Ashy-crowned Sparrow-lark	<i>Eremopterix griseus</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Black-headed Cuckooshrike	<i>Coracina melanoptera</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
White-browed Fantail	<i>Rhipidura aureola</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Jungle Babbler	<i>Turdoides striatus</i>
Ashy Prinia	<i>Prinia socialis</i>
Jungle Prinia	<i>Prinia sylvatica</i>
Green Munia	<i>Amandava formosa</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>

Bird Area because fewer than two species are entirely confined to it.

**OTHER KEY FAUNA**

Almost all the large and small mammals of central India are found in Melghat, including the Tiger *Panthera tigris*, Leopard *P. pardus*, Gaur *Bos frontalis*, Sambar *Cervus unicolor*, Chital *Axis axis*, Barking Deer *Muntiacus muntjak*,



Grey-headed Canary-flycatcher *Culicicapa ceylonensis* is reported from Melghat

Wild Boar *Sus scrofa*, Sloth Bear *Melursus ursinus*, Four-horned Antelope *Tetracerus quadricornis*, Indian Giant Squirrel *Ratufa indica*, Common Langur *Semnopithecus entellus*, and Bonnet Macaque *Macaca radiata*. Indian Giant Flying Squirrel *Petaurista philippensis* is commonly seen here. Madras Treeshrew *Anathana elliotti* is reported from Melghat (Thosre 2014). The Ratel or Honey Badger



Crested Treeswift *Hemiprocne coronata* is a common resident of Melghat



GAJANAN WAGH

Melghat is the stronghold of the Critically Endangered Forest Owl *Heteroglaux blewitti*

*Mellivora capensis* occasionally seen and hunted by tribals (Raju Kasambe, pers. obs.).

The Caracal *Caracal caracal* and Indian Pangolin *Manis crassicaudata* are also reported here (Thosre 2014), as are many smaller cats. Pande (2005) has reported the occurrence of 43 species of mammals, 21 species of reptiles, 53 species of fishes, 48 species of butterflies, and 256 species of birds.

Recently, 114 species of butterflies have been reported from Melghat (Wadatkar & Kasambe 2008). A total of 204 species of spiders have been found in Melghat (<http://melghattiger.gov.in>) website as accessed on 27 June 2014).

#### LAND USE

- Nature conservation and research
- Tourism and recreation

#### THREATS AND CONSERVATION ISSUES

- Invasion by exotic species
- Agricultural intensification and expansion
- Firewood collection
- Grazing
- Shifting cultivation
- Unsustainable exploitation

There are 58 villages, with a population of over 24,335 people inside Melghat Wildlife Sanctuary. Most of them are labourers who were brought into the area for timber harvesting and stayed on. Relocation and settlement of rights are planned for 29 villages, and have already begun in three villages which have been relocated to areas outside the sanctuary. The Forest Department has initiated eco-development schemes on the fringes of the sanctuary. Although there are plans to relocate all the villages, the whole exercise is extremely expensive, so the State



A riparian habitat in Melghat Tiger Reserve

Government and Forest Department are planning to realign the boundaries of Melghat Tiger Reserve.

More than 20,000 heads of cattle roam in the reserve, as a result of which it has been depleted of almost all undergrowth. Two state highways also pass through Melghat Tiger Reserve. *Lantana camara* and *Hyptis suaveolens* have spread to occupy almost 30% and 20% of the Reserve, respectively.

Two projects are a cause of serious concern in Melghat Tiger Reserve: the first is a highway being built through the reserve; the second is the proposed Chikaldhara Pumped Storage Project on the boundary of MTR, which will submerge 100 ha of forest. The area has prime deciduous forest and is frequented by tigers and leopards.

**Denotification plan:** In 1994, 500 sq. km of Melghat Wildlife Sanctuary was denotified, and this drastically reduced the level of protection afforded to this area. Consequently, several illegal activities began in the denotified area. Incidents of encroachment, illegal timber traffic, poaching, and mining have increased sharply.

## KEY CONTRIBUTORS

Kishore Rithe, Deepak Apte, Dilip Yardi,  
Supriya Jhunjhunwala, B. Raha, Raju  
Kasambe, Jayant Wadatkar, N.B. Bhure.

## KEY REFERENCES

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, UK, Unpubl.

Haribal, M. (1991) Yellow-rumped Flycatcher *Ficedula (Muscicapa) zanthopygia*: a new addition to the avifauna of the Indian subcontinent. *JBNHS* 88: 456–458.

Ishtiaq, F. and Rahmani, A.R. (2000) Further information on status and distribution of Forest Owlet (*Athene blewitti*). *Forktail* 16: 125–130.

Jathar, G. (2008) Occurrence of Oriental Scops Owl *Otus sunia sunia* in Melghat Tiger Reserve, Maharashtra. *JBNHS* 105(2): 216–217.

Jathar, G. and Rahmani, A.R. (2004) Ecological studies of the Forest Spotted Owllet *Athene (Heteroglaux) blewitti*. Final report. Bombay Natural History Society. Pp. 77.

Kasambe, R.M. (2002) Additions to the birds of Melghat Tiger Reserve, Maharashtra. *Zoos' Print* 18(3): 1050.

Kasambe, R. and Wadatkar, J. (2006) Record of Malabar Pied Hornbill (*Anthracoceros coronatus*) and other birds from Melghat. *Newsletter for Birdwatchers* 46(5): 67–68.

Kasambe, R., Pande, S., Wadatkar, J. and Pawashe, A. (2004): Additional records of the Forest Owllet *Heteroglaux blewitti* Hume 1873, in Melghat Tiger Reserve, Maharashtra. *Newsletter for Ornithologists* 1(1–2): 12–14.

Kasambe, R., Wadatkar, J., Bhusum, N.S. and Kasdekar, F. (2005a) Forest Owlets *Heteroglaux blewitti* in Melghat Tiger Reserve, Distt. Amravati, Maharashtra. *Newsletter for Birdwatchers* 45(3): 38–40.

Kasambe, R., Pimpalpure, A., Wadatkar, J. and Pillarisett, A. (2005b) Vulture notes from Vidarbha including Melghat and Tadoba Andhari Tiger Reserves. *Newsletter for Birdwatchers* 45(5): 77–78.

Kothari, A. (1998) Sighting of Blackcapped Kingfisher *Halcyon pileata* in Melghat Tiger Reserve, Maharashtra. *Newsletter for Birdwatchers* 38(1): 11.

Mahabal, A. (2005) Aves: Fauna of Melghat Tiger Reserve (Maharashtra). *Conservation Area Series*. No. 24, ZSI, Kolkata: 115–163.

Pande, P. (2005) *National Parks and Sanctuaries in Maharashtra. Reference Guide. Vol.II. Individual Profile and Management Status*. Bom. Nat. Hist. Soc. Pp.531.

Ranjitsinh, M.K. (1985) Saker Falcons in Melghat. *JBNHS* 82: 406–407.

Rithe, K. (2003) Saving the Forest Owllet. *Sanctuary Asia* 23(1): 30–33.

Savarkar, V.B. (1987) Bird Survey of the Melghat Tiger Reserve. *Cheetal* 29: 4–27.

Stattersfield, A.J., Crosby, M.J., Long, A.J. and Wege, D.C. (1998) *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. BirdLife Conservation Series No. 7. BirdLife International, Cambridge, UK.

Thosre, P. (2014) *The wild mammals of Maharashtra*. Published by Mrs. Deepti Thosre. Pp.100.

Wadatkar, J.S. and Kasambe, R. (2008) Butterflies of Melghat Tiger Reserve, Maharashtra with notes on their abundance, status and larval host plants. *The Ecoscan* 2(2): 165–171.

Wadatkar, J.S., Wagh, G.A., Dudhe, N.S. and Thakare, A. (2012): Additions to the checklist of Birds of Melghat Tiger Reserve, an IBA. *Mistnet* 13(2): 6–7.

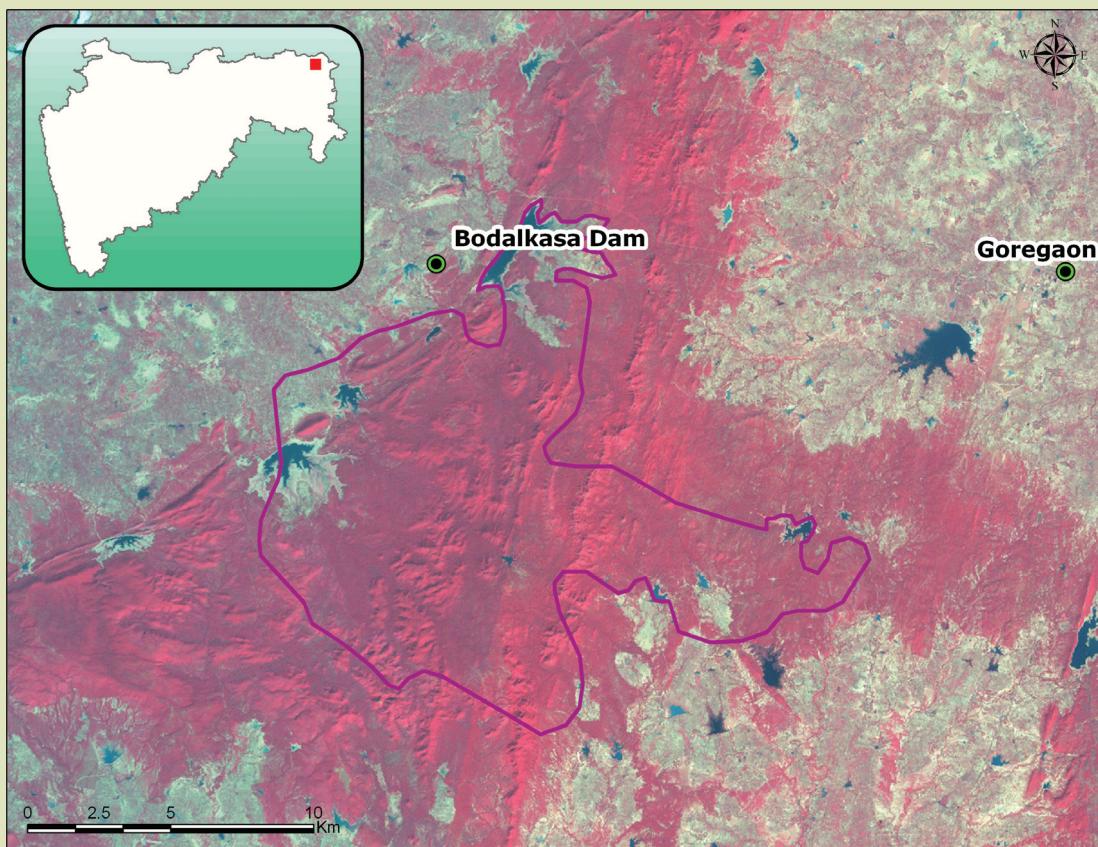
## NAGZIRA TIGER RESERVE

IBA Site Code	: IN-MH-10
District	: Gondia, Bhandara
Coordinates	: 21° 18' 46" N, 80° 04' 03" E
Ownership	: State
Area	: 15,281 ha

Altitude	: 289–511 msl
Rainfall	: 1,500 mm
Temperature	: 6 °C to 45 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Dry Deciduous Forest, Riverine Forest, Tropical Grassland

**IBA CRITERIA :** A1 (Threatened Species), A3 (Biome 11: Indo-Malayan Tropical Dry Zone)

**PROTECTION STATUS :** Wildlife Sanctuary established in 1970. Upgraded to Tiger Reserve on March 2, 2012.



### GENERAL DESCRIPTION:

Nagzira Wildlife Sanctuary lies in the Tirora range of Gondia district and Lakhani range of Bhandara district. Some part lies in Sadak Arjuni range and Goregaon range of Gondia district. The sanctuary is considered an oasis for wildlife in the easternmost part of Maharashtra, the Vidarbha region.

The forests have the advantage of two perennial tanks, one in Nagzira and the other in Thadezari. These two tanks guarantee a water source for wildlife throughout the year. The sanctuary has the rare distinction of allowing no

grazing rights and no forest exploitation since its inception in 1970. The habitat varies from dense mixed forests, bamboo brakes, and grasslands interspersed with fruit and fodder trees, caves and valleys, to aquatic and riparian habitats, along with seasonal streams. There are no villages inside the sanctuary.

Nagzira harbours diverse vegetation ranging from Dry, Mixed Forests to Moist Forests and is classified as a Southern Tropical Dry Deciduous Forest. Teak *Tectona grandis* grows sparsely, associated with *Terminalia tomentosa*, *Anogeissus latifolia*, *Pterocarpus marsupium*,



The near Threatened European Roller *Coracias garrulus* has been reported from Nagzira



Velvet-fronted Nuthatch *Sitta frontalis* in Nagzira

IN-MH-10

### CRITICALLY ENDANGERED

White-backed Vulture	<i>Gyps bengalensis</i>
----------------------	-------------------------

### ENDANGERED

Black-bellied Tern	<i>Sterna acuticauda</i>
--------------------	--------------------------

### VULNERABLE

Asian Woollyneck	<i>Ciconia episcopus</i>
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Pale-capped Pigeon	<i>Columba punicea</i>
Green Munia	<i>Amandava formosa</i>

### NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaetus</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
European Roller	<i>Coracias garrulus</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

### BIOME 11: INDO-MALAYAN TROPICAL DRY ZONE

Red-naped (Black) Ibis	<i>Pseudibis papillosa</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Painted Francolin	<i>Francolinus pictus</i>
Rain Quail	<i>Coturnix coromandelica</i>
Jungle Bush-quail	<i>Perdicula asiatica</i>
Indian Peafowl	<i>Pavo cristatus</i>
Indian Courser	<i>Cursorius coromandelicus</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Yellow-legged Green-pigeon	<i>Treron phoenicoptera</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocypterus birostris</i>
Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahrattensis</i>
Black-rumped Flameback	<i>Dinopium benghalensis</i>
White-naped Woodpecker	<i>Chrysocolaptes festivus</i>
Ashy-crowned Sparrow-lark	<i>Eremopterix griseus</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Black-headed Cuckooshrike	<i>Coracina melanoptera</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
White-browed Fantail	<i>Rhipidura aureola</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Jungle Babbler	<i>Turdoides striatus</i>
Ashy Prinia	<i>Prinia socialis</i>
Jungle Prinia	<i>Prinia sylvatica</i>
Green Munia	<i>Amandava formosa</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>

and *Diospyros melanoxylon*. Bamboo *Dendrocalamus strictus* grows abundantly. The vegetation of Nagzira has been described by Malhotra & Rao (1981).

Four globally Threatened species have been identified from this IBA: White-rumped Vulture *Gyps bengalensis*, Lesser Adjutant *Leptoptilos javanicus*, Green Munia *Amandava formosa*, and Pale-capped Pigeon *Columba punicea*. This IBA may be quite important for Green Munia whose population is declining, mainly due to trapping for trade (R. Bhargava, *pers. comm.* 2003). There are no recent



ADITYA JOSHI

Tropical Dry Deciduous habitat in Nagzira Tiger Reserve

reports of Pale-capped Pigeon, Green Munia, and Lesser Adjutant (Purandare 2008). The numbers of White-rumped Vulture have also drastically declined.

Nagzira was selected as an IBA primarily for its biome species. It is one of the best areas to spot the species of Indo-Malayan Tropical Dry Zone (Biome 11).

## AVIFAUNA

More than 210 bird species have been reported from the sanctuary by Purandare (2008). Chitampalli (1977) recorded three Pale-capped Pigeon *Columba punicea* on a salt lick at the nearby Itiadoh Lake, 80 km south of Nagzira. This bird is found only in the Eastern Ghats, northeast India, and Bangladesh (Grimmett *et al.* 2011), so the presence of this Vulnerable species in this region is interesting, but there is no other published record during the last two decades (Rahmani 2012). Possibly, it is found in many adjoining areas in Maharashtra, Chhattisgarh, and Orissa. This whole region in Central India remains under-explored as far as birdlife is concerned. Jamdar (1982) reported the occurrence of Forest Wagtail *Motacilla indica* in Nagzira. Purandare (2008) also reported six Near Threatened species in Nagzira, namely Malabar Pied Hornbill *Anthracoboceros coronatus*, Black-bellied Tern *Sterna acuticauda*, Grey-headed Fish-eagle *Ichthyophaga ichthyaetus*, Greater Spotted Eagle *Aquila clanga*, Oriental Darter *Anhinga melanogaster*, and

European Roller *Coracias garrulus*.

A large herony of Asian Openbills is reported on a small island in the Chorakhmara Reservoir on the fringe of Nagzira. In the monsoon of 2002, 150 nests were seen, whereas in 2006, around 100 nests were recorded (Kasambe & Pimplapure 2007).

## OTHER KEY FAUNA

Mammals include the Tiger *Panthera tigris*, Leopard *P. pardus*, Wild Dog *Cuon alpinus*, Striped Hyaena *Hyaena hyaena*, Golden Jackal *Canis aureus*, Gaur *Bos frontalis*, Sambar *Cervus unicolor*, Chital *Axis axis*, Four-horned Antelope *Tetracerus quadricornis*, and Barking Deer *Muntiacus muntjak*. Recently, Indian Spotted Chevrotain (Mouse Deer) *Moschiola indica* was spotted here (Kiran Purandare, *pers. comm.* 2012). The sanctuary harbours about 100 species of butterflies (Purandare 2008). Amphibians are represented by Common Tree Frog *Polypedates maculatus*, Fungoid Frog *Rana malabarica*, and Indian Burrowing Frog *Sphaerotheca breviceps*. Among reptiles, besides lizards such as Fan-throated Lizard *Sitana ponticeriana*, Jerdon's Snake-eye *Ophisops jerdonii* is also found here. Snakes including Wolf Snake *Lycodon aulicus*, Striped Keelback *Amphiesma stolata*, Bronzeback Tree Snake *Dendrelaphis tristis*, Forsten's Cat Snake *Boiga forsteni*, Common Cat Snake *Boiga trigonata*, and Banded



PRASHANT GAHALE

River Tern *Sterna aurantia* is often seen at Nagzira tank

Krait *Bungarus fasciatus* were found here in a recent study (Purandare 2008).

#### LAND USE

- Nature conservation and research
- Tourism and recreation

#### THREATS AND CONSERVATION ISSUES

- Firewood collection
- Poaching

Growing tourism is causing disturbance to the wildlife, largely due to traffic noise and pollution. Tree felling also occurs (Kothari *et al.* 1989). The Wildlife Institute of India has proposed that Nagzira Wildlife Sanctuary be extended by 47.19 sq. km and be notified as a National Park (Rodgers *et al.* 2000). Umerzari (an area previously owned and managed by the FDCM Co. Ltd.) has been declared as a wildlife sanctuary. This will create a buffer for the natural resources of Nagzira Wildlife Sanctuary.

The Forest Department has formed the Eco Tourism Committee (ETC) with the help of the villagers residing near the sanctuary. According to ETC norms, the villagers will be entitled to financial benefit to the tune of 80% of the total income gained through ecotourism activities. Ten youths from village Pitezari have been appointed to look after a camp site and cater to the needs of tourists and visitors.

#### KEY CONTRIBUTORS

Girish Jathar, B. Raha, N.B. Bhure, Mukund Dhurve, Kiran Purandare.

#### KEY REFERENCES

Chitampalli, M.B. (1977) Occurrence of and some observations on the Purple Wood-Pigeon in Maharashtra (Bhandara district). *JBNHS* 74(3): 527–528.

Grimmett, R., Inskip, C. and Inskip, T. (2011) *Birds of the Indian Subcontinent*. Christopher Helm (Publishers) Ltd., London, UK. Pp. 528.

Jamdar, N. (1982) Occurrence of Forest Wagtail (*Motacilla indica* Gmelin) in Nagzira Sanctuary, Bhandara District (Maharashtra). *JBNHS* 79(3): 671.

Kasambe, R. and Pimplapure, A. (2007) Heronries in Vidarbha. *Newsletter for Birdwatchers* 47(6): 83–85.

Kothari, A., Pande, P., Singh, S. and Variava, D. (1989) *Management of National Parks and Sanctuaries in India: A status report*. Environmental Studies Division, Indian Institute of Public Administration, New Delhi.

Malhotra, S.K. and Rao, K.M. (1981) The vegetation of Nagzira Wildlife Sanctuary and its environs (Maharashtra state). *JBNHS* 78(3): 475–486.

Purandare, K.V. (2008) *Sakha Nagzira*. Nisarg-Vedh Prakashan, Pune.

Rahmani, A. R. (2012) *Threatened Birds of India – Their Conservation Requirements*. IBCN, BNHS, RSPB, and BirdLife International. Oxford University Press. Pp. xvi + 864.

Rodger, W.A., Panwar, H.S., and Mathur, V.B. (2000) Wildlife Protected Area Network in India : A Review (Executive Summary). Wildlife Institute of India, Dehradun. Pp 4.

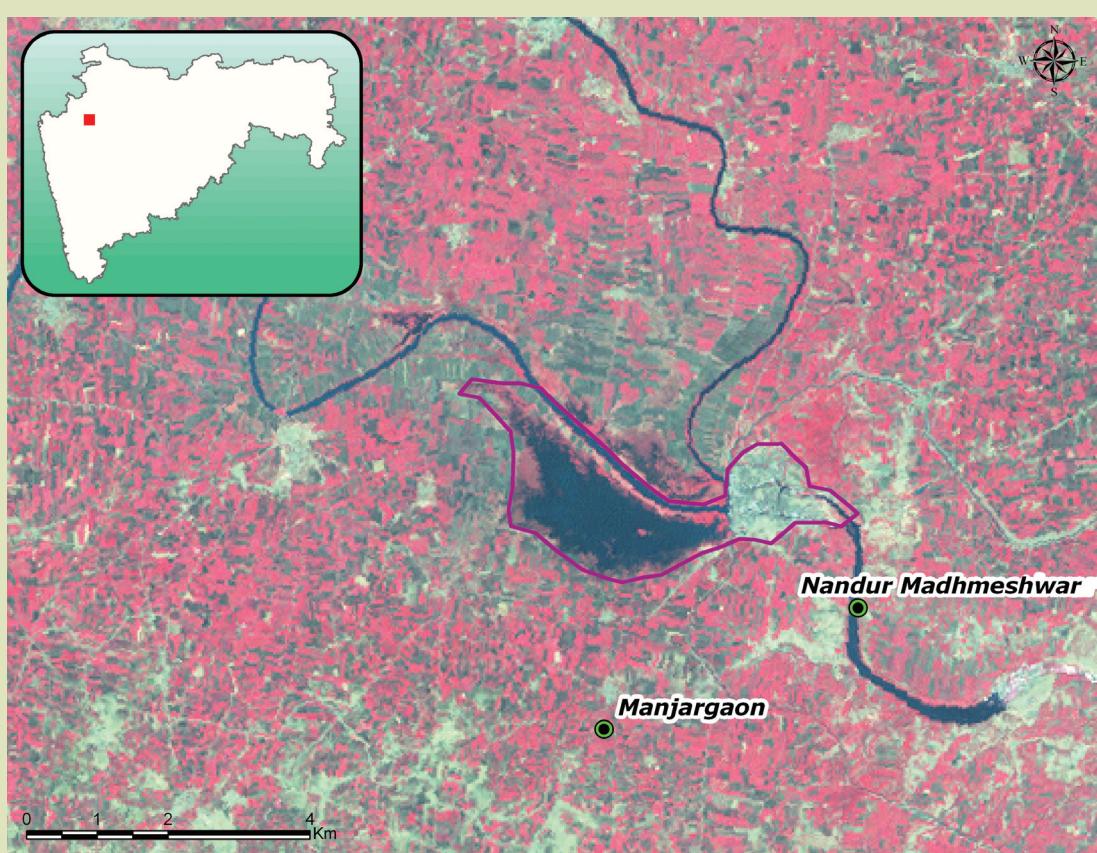
## NANDUR MADHMESHWAR WILDLIFE SANCTUARY

<b>IBA Site Code</b>	: IN-MH-11
<b>District</b>	: Nashik
<b>Coordinates</b>	: 19° 59' 36" N, 74° 01' 50" E
<b>Ownership</b>	: State, Private
<b>Area</b>	: 10,012 ha

<b>Altitude</b>	: 565 msl
<b>Rainfall</b>	: 500 mm
<b>Temperature</b>	: 9 °C to 43 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula
<b>Habitats</b>	: Freshwater Swamp, Tropical Dry Deciduous Forest

**IBA CRITERIA :** A1 (Threatened Species), A4i (>1% biogeographic population), A4ii (>1% global population of seabird or terrestrial species), A4iii (>20,000 waterbirds)

**PROTECTION STATUS :** Wildlife Sanctuary, established in 1986.



### GENERAL DESCRIPTION:

Nandur Madhmeshwar Wildlife Sanctuary was proposed as a potential Ramsar Site as it meets Ramsar Criteria 2 (wetland supports threatened ecological communities), 4 (wetland provides refuge during adverse conditions to threatened species), Criteria 5 (wetland regularly supports 20,000 or more waterbirds), and Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies), and its high ecological values (Islam & Rahmani 2008).

Located near Niphad in Nashik district, Nandur Madhmeshwar is a large water storage reservoir, created by the construction of a dam at the confluence of the Godavari and Kadva rivers. The lake is a pick-up weir constructed in 1907–1913 on the Godavari river to supply water for irrigation. Over the years, the water released from Gangapur and Darana water reservoirs was stored at Nandur Madhmeshwar, and it is released from here through canals for irrigation. Huge quantities of silt and organic matter have accumulated in the lake in the past 95 years, due to

which islands, shallow water ponds, and marshlands have been created. This has resulted in a good wetland habitat for birds. It has been aptly described as the Bharatpur of Maharashtra (Rane 1983).

The Nandur Madhmeshwar irrigation dam and catchment areas are surrounded by sugarcane, onion, jowar, and wheat fields, and grape orchards. There is no forest around this wetland (Rane 1983).

The reservoir fills up with monsoon runoff between July and September, and attracts several species of migratory birds between September and March. The water level fluctuates, depending upon the usage. This suits waterfowl and waders, as most of them prefer shallow water, mudflats, and marshes. Three large islands are also present within the waterbody. About 23 small satellite lakes are present within a radius of 25 km around the reservoir, adding to the overall importance of the region.

About 463 species of plants have been identified (Kumar *et al.* 2002), of which nearly 80 are aquatic.

## AVIFAUNA

Ugaonkar (1989) reported the occurrence of 230 avian species in the area. Recently, Gogte (2013) reported occurrence of 234 species. The reservoir is an important staging and wintering ground for migratory waterfowl, of which >20,000 have been recorded. These include >750 Little Cormorant *Phalacrocorax niger*, 600 Black-winged Stilt *Himantopus himantopus*, 700 Black-tailed Godwit *Limosa limosa*, 500 Little Stint *Calidris minuta*, 250 Lesser Flamingo *Phoeniconaias minor*, and 800 Small Pratincole *Glareola lactea*. Eastern Imperial Eagle *Aquila heliaca* was first seen in December 1983 by Goenka *et al.* (1985). Many species have been seen in numbers much

above their 1% threshold level determined by Wetlands International (2006). For example, 100 White Stork *Ciconia ciconia* were seen (Kumar *et al.* 2002), while their 1% threshold is only 45 individuals in South Asia. More than 1,000 Demoiselle Crane *Grus virgo* are seen in and around Nandur Madhmeshwar, while 100,000 of this species winter in the Indian subcontinent (Wetlands International 2006), therefore, 1% are seen in this IBA site alone, qualifying for A4i criteria. In January 2013, more than 2,000 Common

### CRITICALLY ENDANGERED

White-backed Vulture	<i>Gyps benghalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>

### ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
------------------	------------------------------

### VULNERABLE

Asian Woollyneck	<i>Ciconia episcopus</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>
Indian Spotted Eagle	<i>Clanga hastata</i>

### NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Lesser Flamingo	<i>Phoeniconaias minor</i>
Pallid Harrier	<i>Circus macrourus</i>
Laggar Falcon	<i>Falco jugger</i>
Red-headed Falcon	<i>Falco chicquera</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Great Thick-knee	<i>Esacus recurvirostris</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
European Roller	<i>Coracias garrulus</i>



The shallow wetland habitat of Nandur Madhmeshwar attracts thousands of waterbirds



PURUSHOTTAM J. PATIL

Eurasian Spoonbill *Platalea leucorodia* are common at Nandur Madhmeshwar**BIOME-11: INDO-MALAYAN TROPICAL DRY ZONE**

Red-naped (Black) Ibis	<i>Pseudibis papillosa</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Painted Francolin	<i>Francolinus pictus</i>
Rain Quail	<i>Coturnix coromandelica</i>
Jungle Bush-quail	<i>Perdicula asiatica</i>
Indian Peafowl	<i>Pavo cristatus</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Indian Courser	<i>Cursorius coromandelicus</i>
Yellow-legged Green-pigeon	<i>Treron phoenicopterus</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocypteros birostris</i>
Malabar [Crested] Lark	<i>Galerida malabarica</i>
Ashy-crowned Sparrow-lark	<i>Eremopterix griseus</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Indian Chat	<i>Cercomela fusca</i>
Jungle Babbler	<i>Turdoides striatus</i>
Large Grey Babbler	<i>Turdoides malcolmii</i>
Rufous-bellied Babbler	<i>Dumetia hyperythra</i>
Ashy Prinia	<i>Prinia socialis</i>
Jungle Prinia	<i>Prinia sylvatica</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>

Crane and more than 2,500 Demoiselle Crane were seen here (Umakant Patil, *pers. comm.* 2013). This wetland is an important candidate for Ramsar site status.

Gogte (2013) photographed many threatened species, including the Asian Woollyneck *Ciconia episcopus*, Great Thick-knee *Esacus recurvirostris*, Indian Spotted Eagle *Clanga hastata*, Pallid Harrier *Circus macrourus*, Red-headed Falcon *Falco chicquera*, Eurasian Curlew *Numenius*

*arquata*, Western Black-tailed Godwit *Limosa limosa*, River Tern *Sterna aurantia*, and European Roller *Coracias garrulus*.

**OTHER KEY FAUNA**

The Fishing Cat *Felis viverrina* and over 23 species of fish including *Puntius sophore*, *Channa punctatus*, and *Mystus bleekeri* are the important components of the biodiversity of this site. A preliminary survey by Kurhade & Wagh (*pers. comm.* 2012) found 12 species of odonates (dragonflies and damselflies) and 40 species of butterflies in the area.

**LAND USE**

- Agriculture
- Aquaculture
- Nature conservation and research
- Water management

**THREATS AND CONSERVATION ISSUES**

- Fisheries
- Invasion by exotic plants
- Disturbance to birds
- Livestock grazing
- Excessive siltation filling up the reservoir gradually

The exotic *Eichhornia crassipes* and *Parthenium* sp. have infested the area and need to be removed. Aquatic vegetation is removed for food and fodder on a large scale. Excessive fishing and grazing by domestic livestock also cause disturbance. Diesel engines, which are used along with electric pumps to draw water, cause immense pollution



IN-MH-11

UMAKANT PATIL

Wintering Demoiselle Cranes *Grus virgo* visit this IBA in hundreds

(Kumar *et al.* 2002). The avifauna of the area is considerably disturbed because of blasting undertaken in the area for mining.

The reservoir surroundings, along with partly submerged areas in the IBA, are intensively cultivated for wheat, maize, sugarcane, and vegetables. Poaching of waterfowl, which was quite common earlier (Rane 1983), has been curtailed to a large extent (Kumar *et al.* 2002) after the declaration of the Sanctuary. Nearly 1,758 ha of submergence area was acquired from the Irrigation Department and distributed to landless tribals (Kumar *et al.* 2002). This has brought in greater human presence around the lake.

There is a proposal to take away as much as 8,178 ha from the original 10,013 ha area of the sanctuary (Sudhakar Kurhade, *pers. comm.* 2012). There is also political pressure to denotify this area. People have encroached upon government land and are cultivating it.

In 2013, the Forest Department had announced that six sites were identified to be declared as Ramsar Sites. They are Nandur Madhmeshwar Wildlife Sanctuary (Nashik district), Jaikwadi Bird Sanctuary (Aurangabad district), Ujjani Reservoir (Pune district), Sewri Creek (Mumbai district), Navegaon Bandh Reservoir (Gondia) and Lonar Crater Wildlife Sanctuary (Buldhana district) (<http://www.downtoearth.org.in/news/maharashtra-to-propose-five-wetland-sites-for-recognition-as-ramsar-sites-40159> as accessed on 05

September 2015). However, nothing has happened till date.

#### KEY CONTRIBUTORS

B. Raha, N.B. Bhure, Prashant Wagh,  
Sudhakar Kurhade, Umakant Patil.

#### KEY REFERENCES

Goenka, D., Monga, S. and Srivastava, K. (1985) Imperial Eagle, *Aquila heliaca* Savigny, in Maharashtra – a southward extension of its wintering range. *JBNHS* 82 (2): 406.

Gogte, S. (2013) *Nandur Madhyameshwar: Panthal Jaivavividhata Margadarshika*. Wider Wings Publication, Nashik. Pp. 144.

Islam, M.Z. and Rahmani, A.R. (2008) *Potential and Existing Ramsar Sites in India*. Indian Bird Conservation Network, BNHS, BirdLife International and Royal Society for the Protection of Birds. Oxford University Press. Pp. 592.

Kumar, P., Bhure, N.B. and Nigam, A.K. (2002) Conservation of Nandur Madhmeshwar wetland, India. Pp. 139–146. In: Rahmani, A.R. and Ugra, Gayatri (eds) *Birds of Wetlands and Grasslands: Proceedings of the Sálim Ali Centenary Seminar on Conservation of Avifauna of Wetlands and Grasslands*. Bombay Natural History Society, Mumbai. Pp. x+228.

Rane, U. (1983) Nandur Madhmeshwar: Bharatpur of Maharashtra. *Hornbill* (3): 32–37.

Ugaonkar, D. (1989) *Checklist of birds of Nandur Madhmeshwar, Niphad Taluka*. Nisarg Mitra Mandal. Pp. 7.

Wetlands International (2006) *Waterbird Population Estimates - Fourth Edition*. Wetlands International. Wageningen, The Netherlands. Pp. 239.

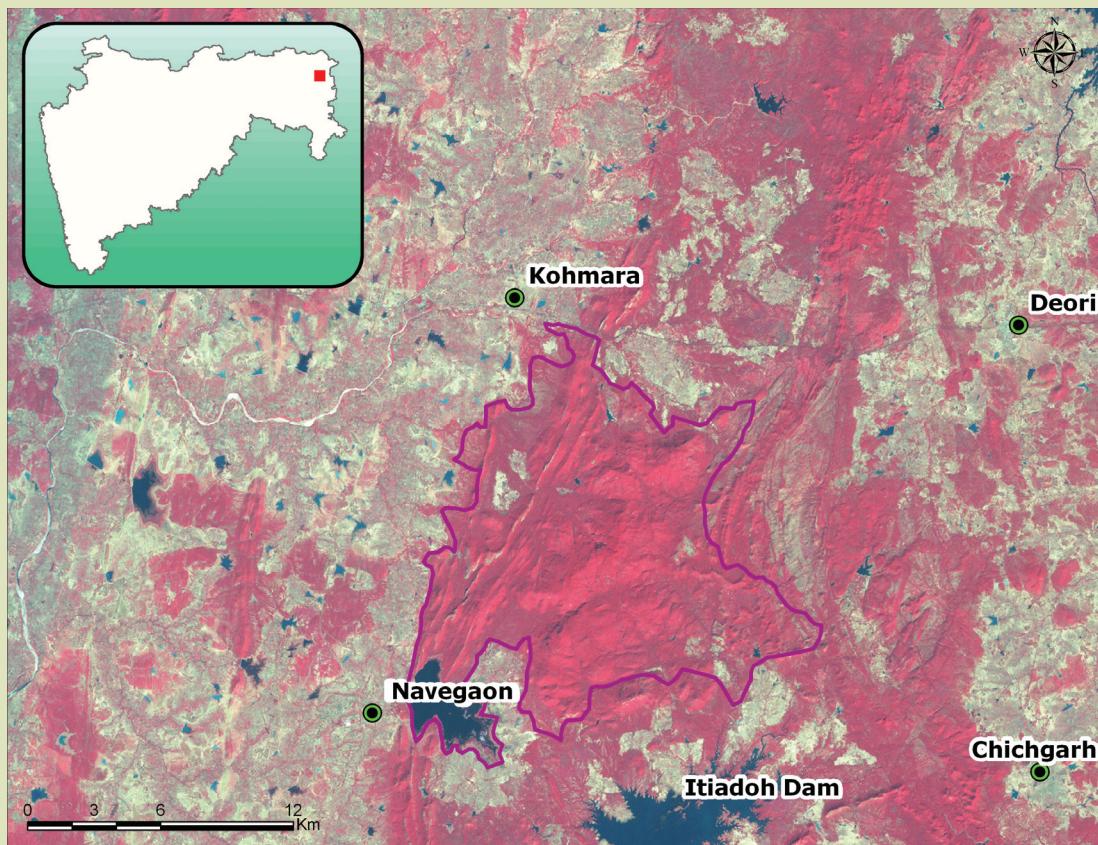
## NAVEGAON NATIONAL PARK

<b>IBA Site Code</b>	: IN-MH-12
<b>District</b>	: Bhandara, Gondia
<b>Coordinates</b>	: 20° 56' 42" N, 80° 10' 56" E
<b>Ownership</b>	: State

<b>Area</b>	: 13,388 ha
<b>Altitude</b>	: 275–481 msl
<b>Rainfall</b>	: 1,200 mm
<b>Temperature</b>	: 7 °C to 47 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula

**IBA CRITERIA :** A1 (Threatened Species), A3 (Biome 11: Indo-Malayan Tropical Dry Zone)

**PROTECTION STATUS :** Wildlife Sanctuary, established in 1975.



### GENERAL DESCRIPTION

Navegaon National Park extends over 13,388 ha, and lies in the southern parts of Bhandara and Gondia districts of Maharashtra. Navegaon Lake, which spreads over 1,100 ha, was formed by the impoundment of a stream at Itiadoh, which is 14 km away. The lake is fringed by low hills covered with forests. It was built by the Kohali community, about 300 years ago. The Gond queen Durgavati invited some experts from Rajasthan to construct this lake. Subsequently, the lake was maintained by the Nizam of Hyderabad, Maratha Bhosale kings, and then the British.

The natural vegetation conforms to Southern Tropical Dry Deciduous Mixed Forest as classified by Champion & Seth (1968). The forest harbours 40 species of trees, 16

species of shrubs, and 44 species of herbs (Ilorkar & Khatri 2003). The dominant vegetation includes *Terminalia tomentosa*, *Pterocarpus marsupium*, *Anogeissus latifolia*, *Lagerstroemia parviflora*, *Butea monosperma*, *Diospyros melanoxylon*, *Bombax ceiba*, *Cassia fistula*, and *Haldina cordifolia*. Bamboo *Dendrocalamus strictus* forms dense undergrowth, and Teak *Tectona grandis* is interspersed with the other trees.

### AVIFAUNA

More than 200 species of birds were listed in the checklist of the Forest Department (Misra, undated), including some doubtful records such as the Greater Adjutant *Leptoptilos dubius* and the Crimson-backed or Small Sunbird *Nectarinia*

A herony with Asian Openbill *Anastomus oscitans* near Navegaon

*minima*. The checklist also includes threatened species like Pallas's Fish-eagle *Haliaeetus leucoryphus* and Great Pied Hornbill *Buceros bicornis*. Although 35 species of ducks, waders, and storks are found, none of them exist in adequate numbers to reach the 1% biogeographical population threshold of Wetlands International (2006). As the lake is quite deep, it is not very attractive to waterfowl, and the numbers found do not satisfy A4iii criteria (>20,000 individuals). However, this site has typical representatives of the birdlife of Tropical Dry Deciduous Forests of central India, and meets A3 criteria. The checklist mentioned earlier includes 26 Biome 11 (Indo-Malayan Tropical Dry Zone) species. The IBA is notable as both Red Junglefowl *Gallus gallus* and Grey Junglefowl *Gallus sonneratii* occur (Chitampalli 1977). It is also the southernmost limit of distribution of the Sarus Crane *Grus antigone*.

In a recent study conducted on a 32 sq. km area during January 2010 to December 2012, Chinchkhede & Kedar (2013) found 126 species in the national park. Paliwal *et. al* (2013) recorded 95 species of waterbirds from the lake and the national park. However, during further studies, 312 species of birds belonging to 57 families and 14 orders were recorded (Paliwal & Bhandarkar 2014a). Out of the 312 avian species recorded, 15 are listed as Threatened (Paliwal & Bhandarkar 2014). These include Critically Endangered Long-billed Vulture *Gyps indicus*, Endangered Egyptian Vulture *Neophron percnopterus*, Near Threatened Oriental Darter *Anhinga melanogaster*, Black-headed Ibis *Threskiornis melanocephalus*, Painted Stork *Mycteria leucocephala*, Black-necked Stork *Ephippiorhynchus asiaticus*, Black-tailed Godwit *Limosa limosa*, Eurasian Curlew *Numenius arquata*, River Tern *Sterna aurantia*, and Malabar Pied Hornbill *Anthracoceros coronatus*, and Vulnerable species like Lesser Adjutant *Leptoptilos javanicus* and Sarus Crane. Paliwal & Bhandarkar (2014b) recorded 38 species of raptors in the Park including Grey-headed Fish-eagle *Ichthyophaga ichthyaetus*, Pallid Harrier *Circus macrourus*, Laggar Falcon *Falco jugger*, and Red-headed Falcon *Falco chicquera*.

CRITICALLY ENDANGERED	
White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Red-headed Vulture	<i>Aegypius calvus</i>
ENDANGERED	
Egyptian Vulture	<i>Neophron percnopterus</i>
VULNERABLE	
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
Sarus Crane	<i>Grus antigone</i>
Green Munia	<i>Amandava formosa</i>
NEAR THREATENED	
Oriental Darter	<i>Anhinga melanogaster</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaetus</i>
Pallid Harrier	<i>Circus macrourus</i>
Laggar Falcon	<i>Falco jugger</i>
Red-headed Falcon	<i>Falco chicquera</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>
BIOME-11: INDO-MALAYAN TROPICAL DRY ZONE	
Red-naped (Black) Ibis	<i>Pseudibis papillosa</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Red-headed Vulture	<i>Aegypius calvus</i>
Red-headed Falcon	<i>Falco chicquera</i>
Painted Francolin	<i>Francolinus pictus</i>
Rain Quail	<i>Coturnix coromandelica</i>
Jungle Bush-quail	<i>Perdicula asiatica</i>
Rock Bush-quail	<i>Perdicula argoondah</i>
Indian Peafowl	<i>Pavo cristatus</i>
Yellow-legged Green-pigeon	<i>Treron phoenicoptera</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocyceros birostris</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahrattensis</i>
Black-rumped Flameback	<i>Dinopium benghalense</i>
Ashy-crowned Sparrow-lark	<i>Eremopterix grisea</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
White-browed Fantail	<i>Rhipidura aureola</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Large Grey Babbler	<i>Turdoides malcolmi</i>
Jungle Babbler	<i>Turdoides striatus</i>
Ashy Prinia	<i>Prinia socialis</i>
Green Munia	<i>Amandava formosa</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>

Joshi *et al.* (2008) recorded a nesting colony of Asian Openbill *Anastomus oscitans* near the IBA. Recently there have been regular records of wintering Greylag Geese *Anser anser* from this IBA (Kasambe *et al.* 2008; Bhimsen Patil Dongarwar, *pers. comm.* 2012).

### OTHER KEY FAUNA

Pande (2005) mentioned the presence of 208 species of plants in the park area, including 91 species of trees and 19 species of grasses. She has also recorded 30 species of mammals, 208 species of birds, and 15 species of reptiles.

The large mammals include the Tiger *Panthera tigris*, Leopard *P. pardus*, Wild Dog *Cuon alpinus*, Hyaena *Hyaena hyaena*, Wolf *Canis lupus*, Sambar *Cervus unicolor*, Gaur *Bos gaurus*, Barking Deer *Muntiacus muntjak*, Four-horned Antelope *Tetracerus quadricornis*, Sloth Bear *Melursus ursinus*, Chinkara *Gazella bennettii*, Chital *Axis axis*, Mouse Deer (Indian Spotted Chevrotain) *Moschiola indica*, Common Otter *Lutra lutra*, and Nilgai *Boselaphus tragocamelus*. One Caracal *Caracal caracal* was recently sighted here (Bhimsen Patil Dongarwar, *pers. comm.* 2012).

Bhandarkar *et al.* (2012) has reported 42 species of reptiles from Navegaon National Park, including Banded Krait *Bungarus fasciatus*. Banded Krait *Bungarus fasciatus* was seen here twice in road kills by Raju Kasambe in 2008.

This snake seems to be a familiar species in and around the IBA, and is known as *Satranjya* (Carpet snake) among the locals (Bhimsen Patil Dongarwar, *pers. comm.* 2012).

Not much is known about the amphibian and fish fauna of Navegaon NP.

### LAND USE

- Agriculture
- Fisheries
- Nature conservation and research
- Tourism

### THREATS AND CONSERVATION ISSUES

- Agricultural intensification and expansion
- Fisheries
- Over-grazing in some areas of the Sanctuary

In 2013, the Forest Department had announced six sites were identified to be declared as Ramsar Sites. They are Navegaon Bandh Reservoir (Gondia district), Nandur Madhmeshwar Wildlife Sanctuary (Nashik district), Jaikwadi Bird Sanctuary (Aurangabad district), Ujjani Reservoir (Pune district), Sewri Creek (Mumbai district), and Lonar Crater Wildlife Sanctuary (Buldhana district) (<http://www.downtoearth.org.in/news/maharashtra-to-propose-five-wetland-sites-for-recognition-as-ramsar-sites-40159> as accessed on 05 September 2015). However, nothing has happened till date.



Grey-headed Fish-eagle *Ichthyophaga ichthyaetus* is commonly in at Navegaon Lake

R. ANANTHA MURTHY



IN-MH-12

RAJU KASAMBE

The number of Sarus Cranes *Grus antigone* at Navegaon has declined

**Tourism and recreation** There are three villages around the lake with a population of about 100 people each, and two small hamlets. Agriculture is practiced, the main crop being paddy. About 50 local fishermen fish in the lake. Some locals feel that the number of birds visiting the lake has declined over the years because of fishing. The boundaries of two villages Kavelevada and Zangaegondhi have not been specified, hence the occupants of these villages encroach into the park land. Ungulates from the park damage crops, causing man-animal conflict. Illicit cutting of bamboo by the villagers has also been reported. There is an influx of tourists on weekends: over 2,000 tourists visit Navegaon National Park on holidays.

#### KEY CONTRIBUTORS

Girish Jathar, Deepak Apte, Kishor Rithe, Raju Kasambe, Bhimsen Patil Dongarwar

#### KEY REFERENCES

Bhandarkar, W.R., Paliwal, G.T., Bhandarkar, S.V. and Kali, A.A. (2012) Herpetofaunal diversity at Navegaon National Park, Distt. Gondia Maharashtra. *International Journal of Environmental Rehabilitation Conservation* 1:42–49.

Champion, H.G. and Seth, S.K. (1968) *A Revised Survey of the Forest Types of India*. Govt. of India Press, Delhi. Pp. 403.

Chinchkhede, K.H. and Kedar, G.T. (2013) Habitat niche and status of birds of Navegaon National Park, Maharashtra. *International Journal of Scientific Research* 2(9): 427–433.

Chitampalli, M.B. (1977) Occurrence of Grey Junglefowl and Red Junglefowl together. *JBNHS* 74(3) 527.

Ilorkar, V.M. and Khatri, P.K. (2003) Phytosociological study of Navegaon National Park (Maharashtra). *Indian Forester* 129(3): 377–387.

Joshi, A., Bhusari, S. and Thomare, K. (2008) Nesting of Asian Openbill near Navegaon National Park (IBA) Maharashtra. *Mistnet* 9(1): 11–12.

Misra, S.S. (undated) Checklist of Birds of Navegaon National Park. Published by Deputy Conservator of Forests, Nagpur. Pp. 17.

Paliwal, G.T. and Bhandarkar, S.V. (2014a) Sighting of Threatened Birds in Navegaon National Park IBA, Maharashtra. *Mistnet* 15(1): 7–9.

Paliwal, G.T. and Bhandarkar, S.V. (2014b) Status and Conservation of Raptors in and Around Navegaon National Park Maharashtra. *International Research Journal of Environmental Sciences* 3(6): 33–37.

Paliwal, G.T., Bhandarkar, S.V. and Bhandarkar, W.R. (2013) Diversity of water birds from Navegaon National Park and its Environs, Maharashtra, India. In National Conference on 'Recent trends in biodiversity conservation and Management'. *Indian Streams Research Journal* Special issue 1: 51–56.

Pande, P. (2005) *National Parks and Sanctuaries in Maharashtra. Reference Guide. Vol.II. Individual Profile and Management Status*. Bom. Nat. Hist. Soc. Pp.531.

Wetlands International (2006) *Waterbird Population Estimates - Fourth Edition*. Wetlands International. Wageningen, The Netherlands. Pp. 23.

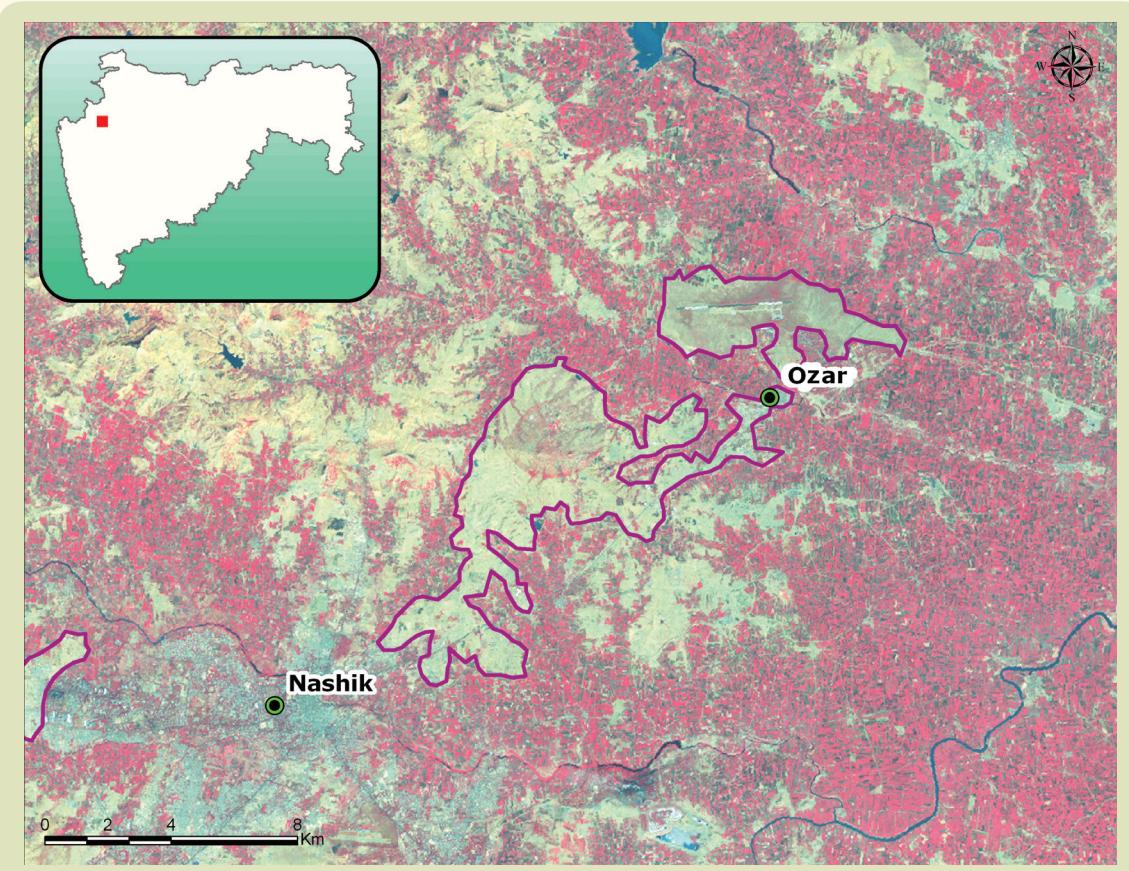
## OZAR, WANI, AND ADJOINING GRASSLANDS

<b>IBA Site Code</b>	: IN-MH-13
<b>District</b>	: Nashik
<b>Coordinates</b>	: 20° 05' 38" N, 73° 53' 32" E
<b>Ownership</b>	: Hindustan Aeronautics Limited (HAL), Defence Research and Development Organization, Forest Department, Private land

<b>Area</b>	: 20,000 ha
<b>Altitude</b>	: 593 msl
<b>Rainfall</b>	: 613 mm
<b>Temperature</b>	: 10 °C to 40 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula
<b>Habitats</b>	: Tropical Thorn Forest, Tropical Grassland

### IBA CRITERIA : A1 (Threatened Species)

**PROTECTION STATUS :** Not officially protected.



### GENERAL DESCRIPTION

Ozar (=Hosur), Wani and adjoining grasslands in the dry district of Nashik came into the limelight in the late 1990s when small populations of the Critically Endangered Great Indian Bustard *Ardeotis nigriceps* and Endangered Lesser Florican *Syphocotides indicus* were discovered (Raha & Prakash 2001a, b). These birds are seen in the 1,430 ha fenced grassland of Hindustan Aeronautics Ltd (HAL) complex, c. 20 km from Nashik. Most of this complex is undulating to flat grassland, except for a small area occupied

by the office, runway, and factory of the HAL complex, which is mainly used to repair military aircraft that are test flown from the runway that almost bisects the grassland. The bustards are quite safe inside the HAL complex, but they also range over a much larger area of about 3,000 ha of similar grasslands and crop fields. Most of the low-lying areas are under cultivation, but the plateaus are covered with short grasses, very conducive for the bustard.

*Heteropogon contortus*, *Cymbopogon martinii*, and *Cynodon dactylon* are the common grass species in this area.



PRASHANT GAHALE

Rain Quail *Coturnix coromandelica* is a common sight in this IBA

#### CRITICALLY ENDANGERED

Great Indian Bustard (locally extinct) *Ardeotis nigriceps*

#### ENDANGERED

Lesser Florican (locally extinct) *Syphocetes indicus*

Among the trees and shrubs, *Acacia* sp., *Santalum album*, and *Dalbergia sissoo* are found.

#### AVIFAUNA

The Great Indian Bustard (GIB) and the Lesser Florican were regularly sighted in this area by Raha & Prakash (2001a, b). The bustard used to breed regularly in the HAL complex, and there was at least one traditional display territory. Sometimes up to three adult males were seen displaying in this area.

The total adult population of GIB was 10–12 birds during 2001. However, the population steadily declined since then, to only seven birds in 2005, three in 2007, two in 2009, a single bird in 2010, and none seen in 2011 (B. Raha, *pers. comm.* 2012).

The Lesser Florican was recorded as common, and probably present throughout the year in Nashik and Ahmednagar districts during the 19th century (Hume & Marshall 1879). There were very few confirmed sightings of Lesser Florican in Maharashtra during the 1980s (Sankaran *et al.* 1992), and none from Nashik district. Since their discovery as breeding birds in Ozar grasslands in 1998, they



PRASHANT GAHALE

The grassland species Indian Courser *Cursorius coromandelicus* breeds in this IBA



Lesser Florican *Sypheotides indica* has not been seen here since 2010

KAUSTUBHA PANDHARIPANDE

were seen regularly in this IBA (B. Raha, *pers. comm.* 2012). However, in 2010 only one Lesser Florican was sighted.

The grassland is rich in avifauna, with more than 200 species identified (B. Raha, *pers. comm.* 2003). Stone Curlew *Burhinus oedicnemus* is also found breeding in this area. As both the trigger species due to which this area was declared as an IBA are not found any more, we suggest that this IBA site should be declassified and considered as IBA in danger.

#### OTHER KEY FAUNA

Detailed study on the fauna of this area has not been done. Indian Grey Wolf *Canis lupus pallipes* is found here. A pair was radio-collared in the HAL area by the Forest Department and Wildlife Institute of India (Thosre 2014). In 2003, a male bustard was killed by wolves (B. Raha, *pers. comm.* 2003).

#### LAND USE

- Defence activities
- Agriculture

#### THREATS AND CONSERVATION ISSUES

- Air traffic
- Poaching outside HAL area

The core area of this site is safe and in possession of Hindustan Aeronautics Ltd. which is highly protected, with restricted entry and limits on other activities.

The Nature Conservation Society, Hosur and IBCN have launched a Save the Bustard Campaign in this area to create awareness among local people outside the HAL complex.

#### KEY CONTRIBUTOR

B. Raha

#### KEY REFERENCES

Hume, A.O. and Marshall, A.H.T. (1879) *The Game Birds of India, Burmah and Ceylon*. Published by the authors, Calcutta.

Raha, B. and Prakash, V. (2001a) Occurrence of Great Indian Bustard *Ardeotis nigriceps* at Hosur, Nashik district, Maharashtra. *JBNHS* 98(1): 110–111.

Raha, B. and Prakash, V. (2001b) Occurrence of Lesser Florican *Sypheotides indica* at Hosur, in Nashik district, Maharashtra. *JBNHS* 98(2): 279.

Sankaran, R., Rahmani, A.R. and Ganguli-Lachungpa, U. (1992) The Distribution and Status of the Lesser Florican *Sypheotides indica* (J.F. Miller) in the Indian Subcontinent. *JBNHS* 89 (2): 163–179.

Thosre, P. (2014) *The Wild Mammals of Maharashtra*. Published by Mrs. Deepthi Thosre. Pp. 100.

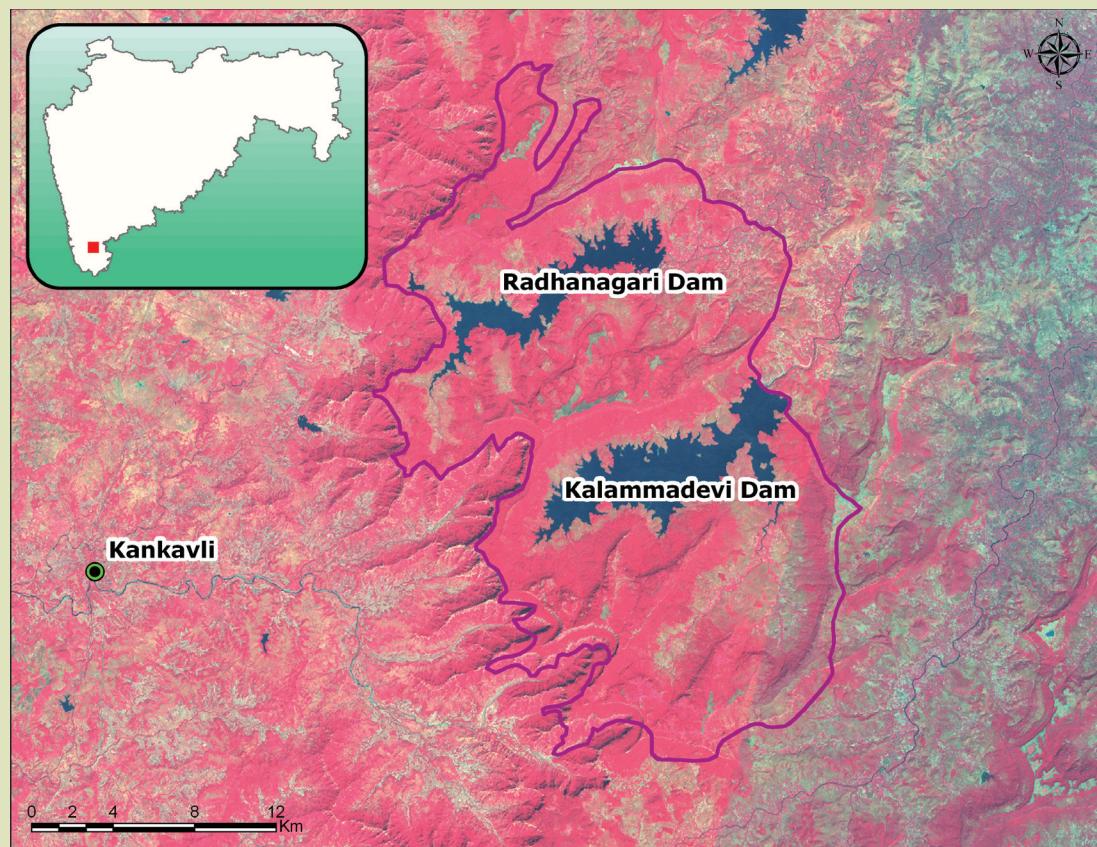
## RADHANAGARI WILDLIFE SANCTUARY

<b>IBA Site Code</b>	: IN-MH-14
<b>District</b>	: Kolhapur
<b>Coordinates</b>	: 16° 22' 60" N, 74° 00' 00" E
<b>Ownership</b>	: State
<b>Area</b>	: 35,116 ha

<b>Altitude</b>	: 972 msl
<b>Rainfall</b>	: 3,500 mm
<b>Temperature</b>	: 6 °C to 36 °C
<b>Biogeographic Zone</b>	: Western Ghats
<b>Habitats</b>	: Tropical Thorn Forest, Tropical Grassland

**IBA CRITERIA :** A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest; Biome 11: Indo-Malayan Tropical Dry Zone)

**PROTECTION STATUS :** Wildlife Sanctuary, established in 1985.



### GENERAL DESCRIPTION

Radhanagari Wildlife Sanctuary is situated on the border of Kolhapur and Sindhudurg districts. This beautiful sanctuary is nestled in the Sahyadri Hills. It lies between two major reservoirs, Shahu Sagar (Radhanagari Dam) and Laxmi Sagar (Kalmamadevi Dam) in Kolhapur district. The terrain is undulating, with steep escarpments and dense forest. The soil is lateritic and in some areas there are huge plateaus with diverse flora and fauna. This forest used to be a hunting ground of the rulers of Kolhapur State, but later it was converted into a sanctuary.

There are several sacred groves inside the sanctuary, which are traditionally protected by the local people. Due to this, large stands of virgin forest still exist. Radhanagari is a major source of water for two large irrigation projects in Kolhapur district. Besides, some parts of the sanctuary are rich in bauxite ore, and many plateaus with high quality bauxite have been mined. The mining company wants more areas to be opened for mining, a major threat to this fragile ecosystem.

As this area lies in the Western Ghats, the plant life is extremely rich. The forest types are Southern Semi-

IN-MH-14

**CRITICALLY ENDANGERED**

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>

**ENDANGERED**

Egyptian Vulture	<i>Neophron percnopterus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

**VULNERABLE**

Asian Woollyneck	<i>Ciconia episcopus</i>
Indian Spotted Eagle	<i>Clanga hastata</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>
Bristled Grassbird?	<i>Chaetornis striatus</i>
Indian Broad-tailed Grass-warbler	<i>Schoenicola platyurus</i>

**NEAR THREATENED**

River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

**ENDEMIC BIRD AREA 123: WESTERN GHATS**

Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>
Malabar Grey Hornbill	<i>Ocyceros griseus</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Small Sunbird	<i>Nectarinia minima</i>
Malabar Parakeet	<i>Psittacula columbooides</i>

**BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST**

Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Malabar Whistling-thrush	<i>Myophonus horsfieldii</i>
Indian Scimitar-babbler	<i>Pomatorhinus horsfieldii</i>
Loten's Sunbird	<i>Cinnyris lotenius</i>

**BIOME 11: INDO-MALAYAN TROPICAL DRY ZONE**

Jungle Bush-quail	<i>Perdicula asiatica</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Black-rumped Flameback	<i>Dinopium benghalensis</i>
Malabar Lark	<i>Galerida malabarica</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Rufous-bellied Babbler	<i>Dumetia hyperythra</i>
Ashy Prinia	<i>Prinia socialis</i>
Jungle Prinia	<i>Prinia sylvatica</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>

evergreen, Southern Evergreen, and Southern Moist Mixed Deciduous. The major tree species are *Memecylon umbellatum*, *Terminalia chebula*, *Careya arborea*, and *Lagerstroemia microcarpa*. Fruiting trees and shrubs like *Syzygium cumini*, *Ficus racemosa*, and *Carissa* spp. are found almost all over the area, attracting many frugivorous birds and mammals. Karvi *Carvia callosa* is the most important and widespread flowering plant in this area, serving as a source of food for a multitude of insects and other herbivorous species.

This IBA has high floral diversity, with over 1,500 flowering plant species being reported (Yadav & Sardesai 2002, Salunkhe & Sardesai 2002). The dense, evergreen rainforests of the western region are locally referred to as *dangs* or *rai*. Areas like the Patacha *dang* have especially large, undisturbed, and well preserved tracts of tropical, wet evergreen forests (Salunkhe & Sardesai 2002).

The sanctuary also hosts threatened and endemic tree species such as *Mappia foetida*, *Turpinia malabarica*, *Euphorbia longana*, *Elaeocarpus tectorium*, and *Harpullia arborea*.

**AVIFAUNA**

About 275 bird species have been recorded from Radhanagari WLS (G. Jathar, *pers. comm.* 2012). The globally Threatened Nilgiri Wood-pigeon *Columba elphinstonii* is seen here in small numbers, especially during the fruiting period. The Western Ghats endemics, Malabar Lark *Galerida malabarica*, which breeds here on laterite plateaus; Vigors's Sunbird *Aethopyga vigorsii* (a true Northern Western Ghats endemic); Indian Rufous Babbler *Turdoides subrufus*; and Malabar Parakeet *Psittacula columbooides* have been reported.

The site lies in the Western Ghats Endemic Bird Area (EBA 123), where Stattersfield *et al.* (1998) have identified 16 restricted-range species. Five such species have been identified from this site, but more are likely to occur.

This IBA represents Biome 10 (Indian Peninsula Tropical Moist Forest). BirdLife International (undated) has listed 15 species in this biome, of which five are found here. Many species of Biome 11 (Indo-Malayan Tropical Dry Zone) are also seen, especially at lower elevations where this site merges with the Deccan Plateau. Biome 11 includes a wide range of habitats, both forests and open country.

During winter, many Himalayan forest birds are found here. Indian Blue Robin *Luscinia brunnea*, a Sino-Tropical Temperate Forest (Biome 7) species, has been seen. Some interesting species such as the Sri Lanka Frogmouth *Batrachostomus moniliger* have been reported from this sanctuary (Giri 2002). The Yellow-browed Bulbul *Iole indica*, Dusky Eagle-Owl *Bubo coromandus*, Great Pied Hornbill *Buceros bicornis*, Square-tailed Black Bulbul *Hypsipetes ganeesa*, Speckled Piculet *Picumnus innominatus*, and Malabar Lark *Galerida malabarica* are commonly seen here. In 2008, two Long-billed Vultures *Gyps indicus* were sighted (Pramod Patil, *pers. comm.* 2012)

**OTHER KEY FAUNA**

Radhanagari Wildlife Sanctuary is well known for its Gaur *Bos gaurus* population. Other mammal species include Tiger *Panthera tigris*, Leopard *P. pardus*, Leopard Cat *Prionailurus bengalensis*, Sloth Bear *Melursus ursinus*, Slender Loris *Loris tardigradus*, Barking Deer *Muntiacus*



FAISAL MAGNET

Indian Rufous Babbler *Turdoides subrufus*, an endemic to the Western Ghats, is seen in Radhanagari



PRASHANT GAHALE

Jerdon's Leafbird *Chloropsis jerdoni* is seen on flowering and fruiting trees in Radhanagari

muntjak, Indian Mouse Deer or Chevrotain *Moschiola indica*, and the elusive nocturnal Indian Pangolin *Manis crassicaudata*. The Indian Giant Squirrel *Ratufa indica* is also reported (Thosre 2014).

There are some endemic and endangered species of reptiles and amphibians, notably the Malabar Pit Viper *Trimeresurus malabaricus*, Deccan Ground Gecko *Geckoella deccanensis*, Gunther's Cat Skink *Ristella guntheri*, Beddome's Lacerta *Ophisops beddomei*, and amphibians such as *Ramanella* sp., Bombay Bush Frog *Philautus bombayensis*, and Humayun's Wrinkled Frog *Nyctibatrachus humayuni* (Varad Giri, pers. comm. 2012).

According to a document prepared by the Ministry of Environment and Forests, Government of India (2006) as many as 47 species of mammals, 59 species of reptiles, 20 species of amphibians, 264 species of birds, and 66 species of butterflies have been recorded in the forests of Radhanagari. In 2004, a census carried out by the Kolhapur Wildlife Division estimated that the Gaur *Bos gaurus* population had risen from 395 to 610 (Anon. 2004). Plans were on to shift some of the Gaur from this sanctuary to Raigad and Thane districts (Anon. 2004). A rise in the populations of Tiger, Leopard, Gaur, Barking Deer, Mouse Deer, and Sloth Bear was reported in here (Anon. 2002). The evergreen forests of the Patacha *dang* are especially favoured by the Indian Giant Squirrel and Malabar Grey Hornbill *Ocyceros griseus* (MoEF 2006).



SAPAGIRISHOLETI

Indian Scimitar-babbler *Pomatorhinus horsfieldii*, which is restricted to the Indian Peninsula, is found in Radhanagari

## LAND USE

- Agriculture
- Mining
- Reservoirs

## THREATS AND CONSERVATION ISSUES

- Bauxite mining
- Irrigation projects
- Encroachment
- Poaching
- Grazing

There is a proposal to construct a minor irrigation dam on Savarde stream which originates from the sanctuary and flows into Waki, a tributary of Doodhganga river. For this the Irrigation Department has asked for denotification of 14.12 ha area, to which the Ministry of Environment and Forests, Government of India has agreed with certain conditions (A.R. Rahmani, mimeographed report to MoEF, 2010).

Bauxite mining is a longstanding problem. The Indian Aluminium Co. Ltd, (INDAL) has done open cast mining, causing irreparable damage to the fragile ecosystem of the plateau. As these plateaus are rocky, tree growth is limited, so the government believes that they are of no importance. However, these grassy plateaus have their own biological and

ecological values, being rich grazing grounds for herbivores and nesting sites for many species of birds. In February 1998, the Mumbai High Court, recognizing the biological and watershed values of Radhanagari, passed a stay order against bauxite mining operations in Iderganj plateau by INDAL. This plateau is a watershed of two major reservoirs that were created when the Radhanagari and Kalammawadi dams were constructed. However, the Forest Department is under intense political pressure to allow mining.

NGOs like Kalpavriksh, Paryavarni, and the Environmental Department of Shivaji University are struggling to have the sanctuary declared as an Ecologically Sensitive Area.

Radhanagari receives more tourists every year. During 2004–2005, a total of 14,833 tourists visited the sanctuary (Padalkar & Gatade 2011).

## KEY CONTRIBUTORS

Girish Jathar, Varad Giri, Deepak Apte.

## KEY REFERENCES

Anon. (2002) Population rise in wildlife in Western Ghat sanctuaries. *PA Update* June (36 & 37).

Anon. (2004) Gaur from Radhanagari WLS to be shifted to Thane and Raigad districts. *PA Update* June (49):16.

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, UK. Unpubl.

Giri, V.B. (2002) Occurrence of the Ceylon Frogmouth *Batrachostomus moniliger* (Family Podargidae) in Radhanagari Wildlife Sanctuary, Maharashtra. *JBNHS* 99(1): 116–117.

MoEF (2006) India's Tentative List of Natural Heritage Properties to be inscribed on the UNESCO World Heritage List. UNESCO, Paris, France.

Padalkar, V.V. and Gatade, D.G. (2011) Tourist Attractions in Radhanagari Wildlife Sanctuary of Kolhapur District (Maharashtra). *Variorum, Multi-Disciplinary e-Research Journal* 2(2) November 2011. Pp.6.

Rahmani, A.R. (2010) Field report to Radhanagari Wildlife Sanctuary, Maharashtra. 8 July 2010. Bombay Natural History Society, Mumbai. Pp. 4.

Salunkhe, A.R and Sardesai, S.D. (2002) *Management Plan for management of Radhanagari Wildlife Sanctuary: 2001–02 to 2010–2011*. Maharashtra Forest Department, Kolhapur, Maharashtra, India.

Stattersfield, A.J., Crosby, M.J., Long, A.J. and Wege, D.C. (1998) *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. BirdLife Conservation Series No. 7. BirdLife International, Cambridge, UK.

Thosre, P. (2014) *The Wild Mammals of Maharashtra*. Published by Mrs. Deepti Thosre. Pp.100.

Yadav, S.R. and Sardesai, M.M. (2002) Flora of Kolhapur district. Shivaji University, Kolhapur, Maharashtra, India. Pp. 679.

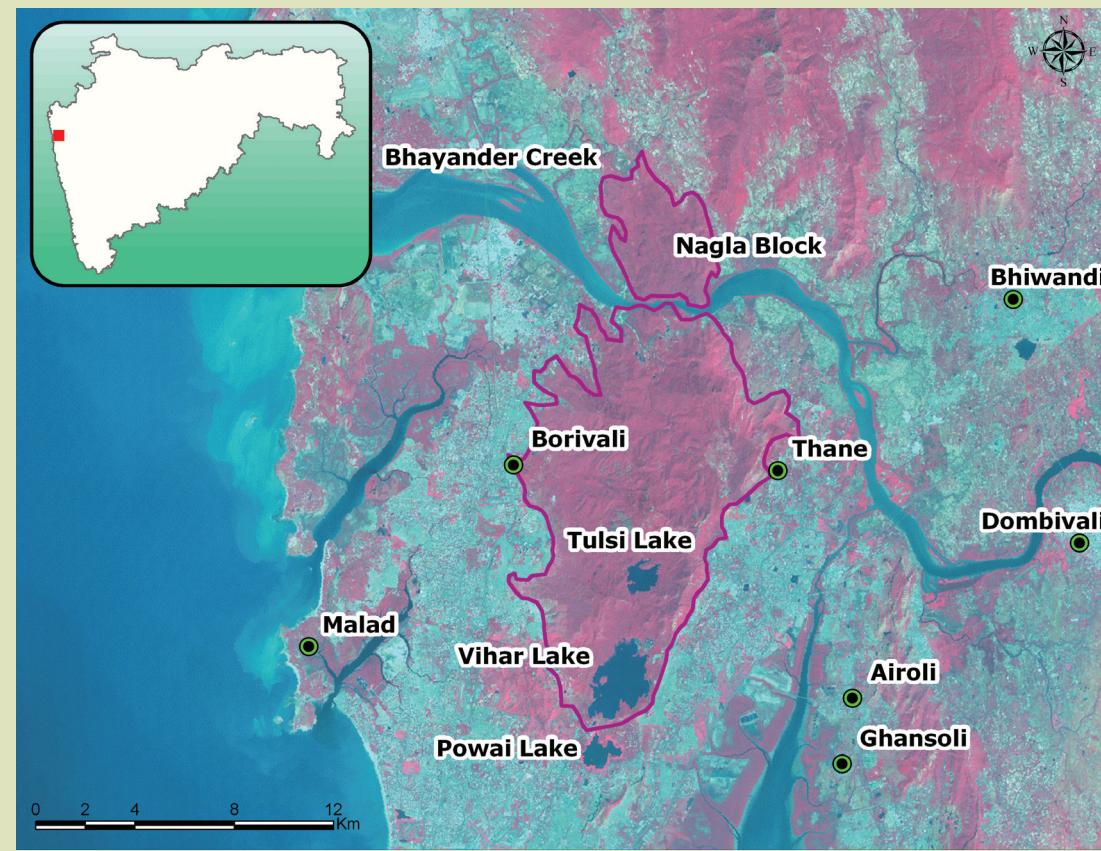
## SANJAY GANDHI NATIONAL PARK-TUNGAreshwar COMPLEX

<b>IBA Site Code</b>	: IN-MH-15
<b>District</b>	: Mumbai, Thane
<b>Coordinates</b>	: 19° 18' 35" N, 72° 57' 48" E
<b>Ownership</b>	: State
<b>Area</b>	: 17,266 ha
<b>Altitude</b>	: 0–500 msl

<b>Rainfall</b>	: 3,500 mm
<b>Temperature</b>	: 17 °C to 37 °C
<b>Biogeographic Zone</b>	: Coasts, Western Ghats
<b>Habitats</b>	: Tropical Dry Deciduous Forest, Tropical Dry Evergreen Forest, Mangroves

**IBA CRITERIA :** A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats),  
A3 (Biome 10: Indian Peninsula Tropical Moist Forest).

**PROTECTION STATUS :** National Park, established in 1983.



### GENERAL DESCRIPTION

This IBA is a complex consisting of Sanjay Gandhi National Park (SGNP, 10,307 ha), Tungareshwar Wildlife Sanctuary (8,570 ha), and the reserve forests between them. Sanjay Gandhi National Park is located in Sahyadri range in the northern Western Ghats. SGNP is unique in being partly located within a mega-metropolis, Mumbai. Part of it lies in the adjoining Thane district. A small portion of the park (about 1.5%) along Vasai creek (known as Bassein), is at sea level and has mangrove patches and other characteristics of

a typical coastal estuarine zone. A large variety of mangrove and coastal fauna is known to exist near Ghod Bunder, Vasai Bunder, and Nagla Bunder. The mangrove patches on the northern banks of Vasai creek are still in reasonably good condition.

SGNP constitutes the prime catchment area of two freshwater lakes, Tulsi and Vihar, which supply water to Mumbai city. These rainfed freshwater lakes have aquatic fauna and flora typical of man-made lakes. Within the park, there are enclosures for Lion Safari and Tiger Safari.



SUNJOY MONGA

The Tropical Dry Evergreen Forest of Sanjay Gandhi National Park is surrounded by Mumbai City

The ancient Kanheri Caves at the centre of the park add great historical importance. About 104 rockcut caves, evidence of Buddhist monastic settlements from the 2nd to 9th century CE, contain some beautiful sculptures. The caves contain *viharas* (monasteries) and *chaityas* (temples), with stone beds and cisterns intact.

The forest is Tropical Dry Deciduous or Southern Dry Deciduous as classified by Champion & Seth (1968), dominated by Teak *Tectona grandis* and Bamboo *Dendrocalamus strictus*. Other associated species are *Pterocarpus marsupium*, *Haldina cordifolia*, *Boswellia serrata*, *Diospyros melanoxylon*, *Terminalia arjuna*, *Syzygium cumini*, and *Terminalia tomentosa*. The area also bears patches of Evergreen Forest or Western Subtropical Hill Forest. Monga (2004, 2006) reported 284 species of birds in SGNP. In Tungareshwar WLS, the habitat is more moist deciduous. About 600 species of plants and 36 species of herpetofauna are reported from this sanctuary (Deepak Apte, *pers. comm.* 2012), besides 172 species of butterflies (Kasambe 2012).

## AVIFAUNA

Sanjay Gandhi National Park is rich in flora and fauna. A total of 284 species of birds have been identified, including

some threatened ones. The rich avifauna includes White-rumped Vulture *Gyps bengalensis* (now extremely rare), Long-billed or Indian Vulture *Gyps indicus* (also extremely rare now), Pallas's Fish-eagle *Haliaeetus leucoryphus* (not seen in recent years), Greater Spotted Eagle *Clanga clanga*, Lesser Adjutant *Leptoptilos javanicus* (Andheria 2003), Nilgiri Woodpigeon *Columba elphinstonii*, Emerald Dove *Chalcophaps indica*, Drongo-cuckoo *Surniculus lugubris*, Malabar Trogon *Harpactes fasciatus*, Oriental Dwarf Kingfisher *Ceyx erithaca*, and Vigor's Sunbird *Aethopyga vigorsii*. Blue-tailed Bee-eater *Merops philippinus* winters in and around Mumbai (Kasambe 2010). Andheria *et al.* (2003) reported sighting Malabar Pied Hornbill *Anthracoceros coronatus* in SGNP. Red-headed Vulture *Sarcogyps calvus* is also reported from the park (Rahmani 2012). In March 2011, Sri Lanka Frogmouth *Batrachostomus moniliger* was sighted (Kasambe 2012b). A small population of Red-breasted Parakeet *Psittacula alexandri*, possibly escapees, is found in Mumbai city and at least three birds are seen along the fringe of SGNP (Kasambe 2014). In November 2012, Orange-breasted Green-pigeon *Treron bicinctus* was sighted here (*Sunjoy Monga, pers. comm.*).

SGNP-Tungareshwar lies in the Western Ghats Endemic Bird Area (EBA 123) where Stattersfield *et al.* (1998) have

**CRITICALLY ENDANGERED**

White-rumped Vulture (extremely rare)	<i>Gyps benghalensis</i>
Long-billed Vulture (extremely rare)	<i>Gyps indicus</i>
Red-headed Vulture (extremely rare)	<i>Aegypius calvus</i>

**VULNERABLE**

Lesser Adjutant	<i>Leptoptilos javanicus</i>
Asian Woollyneck	<i>Ciconia episcopus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Pallas's Fish-eagle (old record)	<i>Haliaeetus leucoryphus</i>
Indian Skimmer	<i>Rynchops albicollis</i>
Nilgiri Woodpigeon	<i>Columba elphinstonii</i>

**NEAR THREATENED**

Red-headed Falcon	<i>Falco chicquera</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Red-breasted Parakeet (escapee)	<i>Psittacula alexandri</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

**ENDEMIC BIRD AREA 123: WESTERN GHATS**

Nilgiri Woodpigeon	<i>Columba elphinstonii</i>
--------------------	-----------------------------

**BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST**

Malabar Trogon	<i>Harpactes fasciatus</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>
Malabar Whistling-thrush	<i>Myophonus horsfieldii</i>
Indian Scimitar-babbler	<i>Pomatorhinus horsfieldii</i>
Loten's Sunbird	<i>Cinnyris lotenius</i>

identified 16 restricted-range species, of which only one has been found here till now. This IBA also lies in Biome 10 (Indian Peninsular Tropical Moist Forest) as defined by BirdLife International (undated). Fifteen species are considered representative of this biome, of which four have been found here. This IBA and its surrounding areas have 26 species of Biome 11 (Indo-Malayan Tropical Dry Zone), most of them common and widespread.

A variety of aquatic birds, both resident and migrant, frequent the mangroves along the Bassein Creek (Vasai) and the marshy margins of Vihar Lake (Monga 2000).

**OTHER KEY FAUNA**

The faunal diversity of SGNP includes 59 species of mammals, 52 species of reptiles, 13 species of amphibians, 30 species of fishes, 172 species of butterflies (Kasambe 2012a), and 24 species of ants. Bastawade & Khandal (2006) reported 61 species of spiders in SGNP. In 2013, 61 species of dragonflies were recorded by a team of naturalists (Saurabh Sawant, *pers. comm.*). A Tiger *Panthera tigris* was sighted in SGNP on June 26, 2003 by Mayur N. Kamath after 83 years.

Marsh Crocodile *Crocodylus palustris* has been reintroduced into Tulsi Lake and Vihar Lake. Leopard *Panthera pardus* is the largest carnivore, with a healthy population of about 40 individuals, perhaps the highest natural leopard density within any metropolis in the world. These leopards mainly subsist on stray dogs, Konkan

Langur *Semnopithecus hypoleucus iulus*, Bonnet Macaque *Macaca radiata*, Wild Boar *Sus scrofa*, Chital *Axis axis*, Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak*, and Four-horned Antelope *Tetracerus quadricornis*. Indian Chevrotain or Mouse Deer *Moschiola indica* is not uncommon, but rarely seen due to its secretive nature. A decade ago in May–June 2003, even a Tiger was seen in Tungareshwar WLS.

Some of the important species of reptiles reported from this IBA are the introduced Crocodile *Crocodylus palustris*, Pond Terrapin *Melanochelys trijuga*, Deccan Banded Gecko *Geckoella dekkanensis*, and the Spotted Forest Gecko *G. collegalensis*.

**LAND USE**

- Nature conservation and research

**THREATS AND CONSERVATION ISSUES**

- Illegal tree felling
- Man-animal conflict
- Encroachment
- Illegal stone quarries
- Firewood collection
- Poaching
- Tourism
- Anti-social elements
- Forest Fires

Sanjay Gandhi National Park is unique in being a protected area within city limits. Encroachment by slum colonies, smuggling of timber, firewood collection, poaching, other anti-social activities, and human-animal conflict are growing rapidly. Frequent human-animal conflict clearly indicates the increasing pressure of these negative anthropogenic activities on the natural habitat of wild animals.

**Man-animal Conflict**

During 2002 to 2004, there were 84 instances of leopard attack on humans in the vicinity of the park, resulting in death or injury of humans (BNHS 2009).

A study by Bhatia *et al.* (2013) indicated that the maximum number of leopard attacks on humans in a year were reported in 2004. The number of attacks declined from 2005, with the Forest Department resorting to trapping of these leopards and relocating them.

**Forest Fires**

Forest fires are a regular problem for this park which is surrounded by human habitation. From 2005 to 2010, 1,001.47 hectares of forest was burnt. During this period, 357 forest fires were reported. Forest fires threaten the very existence of the smaller species as they turn leaf litter on the ground to ash. They also disturb the ecology of the area and some of the larger fires damage trees. Once the forest land

is cleared of vegetation, it becomes much easier for the locals to claim it for purposes like agriculture (Krishna Tiwari *pers. comm.*).

Mahashivaratri, a festival venerating Lord Shiva, is celebrated in February or early March, and it completely changes the face of the park. More than 200,000 people throng SGNP on their way to the Kanheri Caves and Gomukh temple. Thus, considerable stretches of the forest area are swamped by garbage or damaged by fire (Monga 2000).

A water purification plant, stone quarry, and the Film City within the Park are also major concerns. A herd of about 500 feral cattle graze in the park. Villagers, especially tribals, cultivate the park land and depend on the forest for their livelihood.

Tungareshwar WLS also suffers from many biotic pressures. Illegal expansion of roads and diversion of natural streams have created ecological disturbance. A cart track, as shown in forest topographical sheets, has been illegally converted into a road 20 m wide that provides vehicular access to the public. Another path from Parol to Sadanand Baba Ashram, once pristine forest, has been converted into a road 10 m wide, and is yet another example of blatant violation of the Indian Forest Conservation Act. After lobbying by BNHS, the Government of Maharashtra declared 8,570 ha as Tungareshwar Wildlife Sanctuary in November 2003. It is hoped that sanctuary status will help in curtailing the illegal activities mentioned above. Considering it is a recreational area coupled with a temple and ashram, the sanctuary is facing threats from large numbers of tourists, who often carry plastic and other non-biodegradable material, and are also responsible for forest fires.

In order to ensure the long-term viability of Sanjay Gandhi National Park and Tungareshwar Wildlife Sanctuary, it is vital to protect the reserve forests lying between them.

## KEY CONTRIBUTORS

Rushikesh Chavan, Deepak Apte, Debi Goenka, Sunjoy Monga, Vijay A. Paranjpye.

## KEY REFERENCES

- Anon. (2009) Preliminary study on the diet composition of the Leopard (*Panthera pardus fusca*) in Sanjay Gandhi National Park. BNHS, Mumbai.
- Andheria, A. (2003) First sighting of Lesser Adjutant-Stork *Leptoptilos javanicus* from Sanjay Gandhi National Park, Mumbai. *JBNHS* 100(1): 111.
- Andheria, A., Jhunjhunwala, S. and Khanvilkar, P. (2003) Sighting
- of Malabar Pied Hornbill *Anthracoceros coronatus* in Sanjay Gandhi National Park, Mumbai. *JBNHS* 100(1): 142–143.
- Bastawade, D.B. and Khandal, D. (2006) Arachnida: Araneae (Spiders). Zoological Survey of India. Fauna of Sanjay Gandhi National Park (Invertebrates). Conservation Area Series. 26: 139–184.
- BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project Briefing Book*. BirdLife International, Cambridge, UK. Unpubl.
- Bhatia, S., Athreya, V., Grenyer, R. and Macdonald, D.W. (2013) Understanding the Role of Representations of Human-Leopard Conflict in Mumbai through Media Content Analysis. *Conservation Biology*, 1–7. Society for Conservation Biology. DOI: 10.1111/cobi.12037.
- Champion, H.G. and Seth, S.K. (1968) *A revised survey of the forest types of India*. Govt. of India Press, Delhi. Pp. 403.
- Kasambe, R. (2010) Blue-tailed Bee-eaters are ‘winter migrants’ in and around Mumbai. *Newsletter for Birdwatchers* 50(3): 33–34.
- Kasambe, R. (2012a) Butterfly fauna of the Sanjay Gandhi National Park and Mumbai. *Bionotes* 14(3): 76–80.
- Kasambe, R. (2012b) Range extension of Sri Lankan Frogmouth (*Batrachostomus moniliger*) upto Mumbai. *Newsletter for Birdwatchers* 52(3): 37.
- Kasambe, R. (2014) Updates in the IUCN Red List of Threatened Birds of India. *Mistnet* 15(1): 17–18.
- Monga, S. (2000) *City Forest: Mumbai’s National Park*. India Book House Ltd., Mumbai. Pp. 160.
- Monga, S. (2004) *Birds of Mumbai*. India Book House, Mumbai. Pp. 176.
- Monga, S. (2006) *Birds of Sanjay Gandhi National Park*. Bombay Natural History Society, Mumbai. Pp. 36.
- Rahmani, A.R. (2012) *Threatened Birds of India – Their Conservation Requirements*. IBCN, BNHS, RSPB, and BirdLife International. Oxford University Press. Pp. xvi + 864.
- Stattersfield, A.J., Crosby, M.J., Long, A.J. and Wege, D.C. (1998) *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. BirdLife Conservation Series No. 7. BirdLife International, Cambridge, UK.



Blue Mormon *Papilio polymnestor* has been declared as the ‘State Butterfly’ of Maharashtra

RAJU KASAMBE

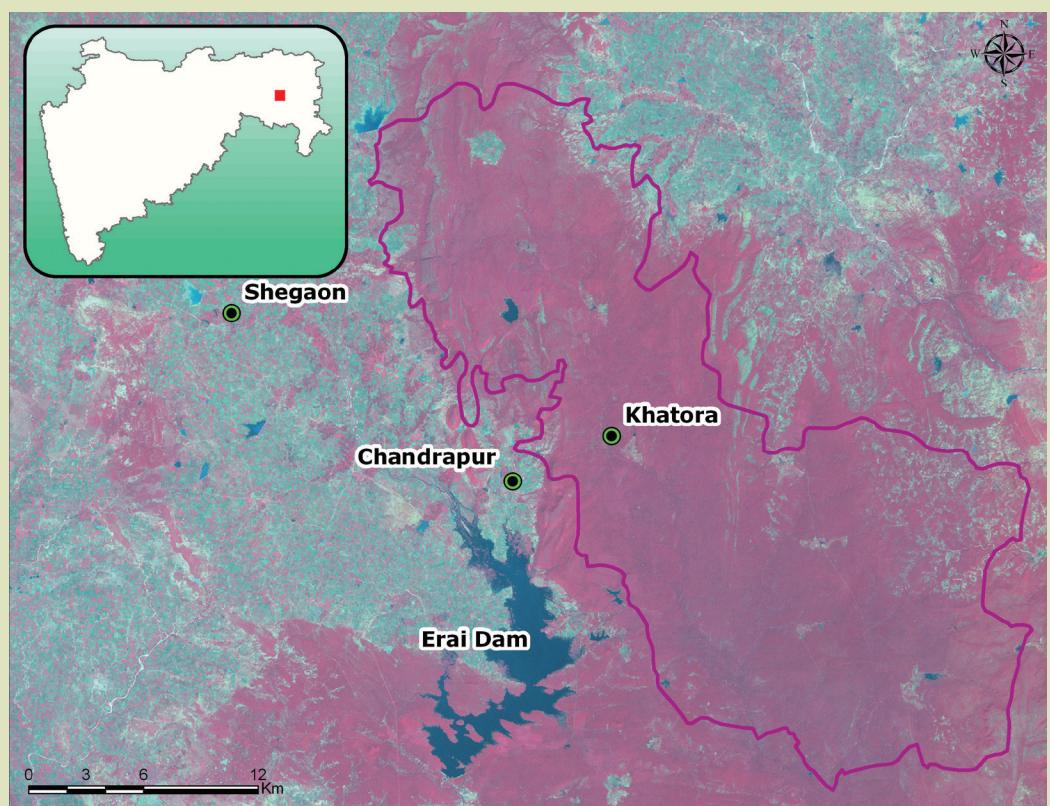
## TADOOBA-ANDHARI TIGER RESERVE

<b>IBA Site Code</b>	: IN-MH-16
<b>District</b>	: Chandrapur
<b>Coordinates</b>	: 20° 23' 23" N, 79° 26' 05" E
<b>Ownership</b>	: State
<b>Area</b>	: 62,540 ha

<b>Altitude</b>	: 212–360 msl
<b>Rainfall</b>	: 1,175 mm
<b>Temperature</b>	: 5 °C to 48 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula
<b>Habitats</b>	: Tropical Dry Deciduous Forest, Freshwater Swamp

**IBA CRITERIA :** A1 (Threatened Species), A3 (Biome 11: Indo-Malayan Tropical Dry Zone)

**PROTECTION STATUS :** National Park in 1955, and Tiger Reserve in 1995.



### GENERAL DESCRIPTION

The Tadoba-Andhari Tiger Reserve is located in three ranges: Moharli, Tadoba, and Kolsa in West Chandrapur Forest Division. Tadoba National Park was declared in 1955, and is one of the oldest national parks of India. It occupies an area of 11,655 ha, while Andhari Wildlife Sanctuary occupies 50,885 ha. Together they form the Tadoba-Andhari Tiger Reserve, covering a core area of 62,540 ha. In 2010, buffer area of 1101 sq kms was declared. Now total area of core and buffer is 1727 sq. kms. The park contains Lake Tadoba, which is visited by migratory waterfowl in winter. There are two more lakes, Kolsa and Jamni, which are also visited by winter migrants.

The name Tadoba is traceable to a king named Taru who was believed to have been killed by a tiger and was deified by the tribals (Tuljapurkar 1994). They established a shrine in his memory, which is visited by the local tribals.

The habitat of these two protected areas, consisting of Southern Tropical Dry Deciduous Forest, interspersed with several large meadows, is such that it provides good herbivore prey density for large cats.

The forest is typical Southern Tropical Dry Deciduous Forest, dominated by teak *Tectona grandis* and Bamboo *Dendrocalamus strictus*. Other associates are *Pterocarpus marsupium*, *Haldina cordifolia*, *Boswellia serrata*, *Diospyros melanoxylon*, *Terminalia arjuna*, *T. tomentosa*,

IN-MH-16

and *Syzygium cumini*, interspersed with bamboo. In some areas, patches of Moist Deciduous Forest are present, the prominent species being *Syzygium cumini*, *Actinodaphne hookerii*, *Terminalia chebula*, and *Olea dioica*. Epiphytes, lichens, and ferns are also recorded.

## AVIFAUNA

In the checklist prepared by the Forest Department, 181 bird species are mentioned (Rajkondawar 1991). Yogesh Dubey (*pers. comm.* 2003) has listed 185 bird species.

### CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Red-headed Vulture	<i>Aegypius calvus</i>

### ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
------------------	------------------------------

### VULNERABLE

Asian Woollyneck	<i>Ciconia episcopus</i>
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Sarus Crane	<i>Grus antigone</i>
Green Munia	<i>Amandava formosa</i>

### NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Lesser Fish-eagle	<i>Ichthyophaga humilis</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaetus</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

### BIOME 11: INDO-MALAYAN TROPICAL DRY ZONE

Red-naped (Black) Ibis	<i>Pseudibis papillosa</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Painted Francolin	<i>Francolinus pictus</i>
Rain Quail	<i>Coturnix coromandelica</i>
Jungle Bush-quail	<i>Perdicula asiatica</i>
Indian Peafowl	<i>Pavo cristatus</i>
Yellow-legged Green-pigeon	<i>Treron phoenicopterus</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocypterus birostris</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahrattensis</i>
Black-rumped Flameback	<i>Dinopium benghalense</i>
Ashy-crowned Sparrow-lark	<i>Eremopterix grisea</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Indian Chat	<i>Cercomela fusca</i>
Jungle Babbler	<i>Turdoides striatus</i>
Ashy Prinia	<i>Prinia socialis</i>
Jungle Prinia	<i>Prinia sylvatica</i>
Green Munia	<i>Amandava formosa</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>

This site qualifies for A1 criteria as five globally Threatened species have been identified within it. It harbours the typical birds of Central Indian Tropical Dry Deciduous Forest. Of the 59 species listed by BirdLife International (undated) for Biome 11, 23 have been seen here. Most of them are quite common and present in other parts of India, and owing to the long history of protection of these forests, they are doing quite well. This site was selected as an IBA both for threatened species (A1) and biome species (A3).

Some interesting records are as follows: Haribal (1986) reported the occurrence of the Great Crested Grebe *Podiceps cristatus* at Tadoba; Dhamankar (2001 a, b) found Indian Slaty-breasted Rail *Rallus striatus*, and nesting of Indian Pitta *Pitta brachyura*. He also found a pair of Sarus breeding at the nearby Mohurli Lake that lies on the outskirts of the park (Dhamankar 2003). Even after ten years, a single Sarus was sighted here on July 7, 2013 (Nandkishor Dudhe, *pers. comm.* 2014). Kasambe *et al.* (2005) reported White-rumped Vulture *Gyps bengalensis* and Long-billed Vulture *G. indicus* from the area. In 2004–2005, there were four nests of White-rumped Vulture near Tadoba. Unfortunately, there has been no sighting of *Gyps* vultures since 2009. There are a few stray records of Red-headed Vulture in the last few years (Sanjay Karkare, *pers. comm.* 2012).

Imperial Green-Pigeon *Ducula aenea* was sighted in the summer of 2011. A few pairs of Lesser Adjutant *Leptoptilos javanicus* breed along the periphery of the tiger reserve (Sanjay Karkare, *pers. comm.* 2012). Breeding of Streaked Weaver *Ploceus manyar* has been observed regularly in the Mohurli range of Tadoba (M.S.R. Shad, *pers. comm.* 2012).

Shariff (2009) reported the sighting of three Near Threatened species, namely Black-headed Ibis *Threskiornis melanocephalus*, Lesser Fish-eagle *Ichthyophaga humilis*, and Grey-headed Fish-eagle *Ichthyophaga ichthyaetus*.

Rahul Rao, (*pers. comm. May 2014*) reported Amur Falcon (*Falco amurensis*) in relocated Navegaon area.

## OTHER KEY FAUNA

Pande (2005) has mentioned the presence of 705 species of plants, including 333 species of herbs, 112 species of trees, and 76 species of grasses. She has also mentioned 28 species of mammals, 235 species of birds, 30 species of reptiles, 5 species of amphibians, 26 species of spiders, and 70 species of insects.

According to Pande (2005), the important mammal species found here include the Tiger *Panthera tigris*, Leopard *P. pardus*, Indian Wild Dog *Cuon alpinus*, Leopard Cat *Prionailurus bengalensis*, Gaur *Bos frontalis*, Sambar *Cervus unicolor*, Chital *Axis axis*, Barking Deer *Muntiacus muntjak*, Wild Boar *Sus scrofa*, Sloth Bear *Melursus ursinus*, Four-horned Antelope *Tetracerus quadricornis*, Indian Giant Squirrel *Ratufa indica*, Common Langur



IN-MH-16

ANIEYA JOSHI

Lesser Adjutant *Leptoptilos javanicus* breeds in Tadoba in small numbers

*Semnopithecus entellus*, Bonnet Macaque *Macaca radiata*. Indian Pangolin *Manis crassicaudata* (also reported by Thosre 2014), and Mouse Deer (Indian Spotted Chevrotain) *Moschiola indica*.

Recently, S. Wazalwar found an Indian Egg-eater *Elachistodon westermanni*, which is protected under Schedule I of the Wildlife (Protection) Act of India, in the buffer zone of Tadoba (Srinivasulu *et al.* 2013). Marsh Crocodile *Crocodylus palustris* has been introduced in Tadoba Lake.

#### LAND USE

- Tourism and recreation
- Nature conservation and research

#### THREATS AND CONSERVATION ISSUES

- Construction and impact of dams
- Forest grazing
- Firewood collection
- Man-animal conflict
- Forest fires
- Poaching

Tadoba National Park and Andhari Wildlife Sanctuary are surrounded by many villages. There are three villages

inside the tiger reserve and 52 on the periphery. The area under the control of the Forest Department differs from the notified area. Illegal grazing and hunting are known to occur and patrolling is necessary. Illegal tree felling, encroachment, and crop raiding by wildlife result in man-animal conflict.

There was a proposal by Adani Power Ltd (APL) for coal mining in Lohara west and Lohara extension near Tadoba-Andhari Tiger Reserve (TATR) which was rejected in 2009. If this proposal ever gets through it will result in the loss of over 1,400 ha of excellent forest cover. Though there has been great opposition from environmentalists, APL is still trying to get environmental clearance for the project (Vijay Pinjarkar, *pers.comm.* 2012).

The construction of a dam is proposed outside the reserve near Sirkada village. This IBA has gained from excellent protection measures, but the benefits will be negated if the irrigation project is allowed to come up. This project will submerge almost 3,000 ha of forests adjoining the reserve. Apart from the direct loss of forest land due to submergence, there will also be disturbance during the construction process, workers' colonies, fishing operations on the reservoir, and secondary pressure on surrounding forests. The project will also destroy the continuity of tiger habitat between Tadoba



SANJAY KARKARE

Tadoba has become a favourite destination to see tigers in central India

and Indravati Tiger Reserve in Chhattisgarh. The reservoir formed by the dam will prevent free movement of wildlife to the east and southeast of Tadoba.

### KEY CONTRIBUTORS

Sanjay Karkare, M.S.R. Shad, Anish Andheria, Deepak Apte, Rushikesh Chavan, Vijay Pinjarkar, Girish Jathar, and Sanjay Karkare

### KEY REFERENCES

BirdLife Internatioan (undated) *Important Bird Area (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, UK. Unpubl.

Dhamankar, A. (2001a) The first record of Indian Blue-breasted Banded Rail (*Rallus striatus*) from east Maharashtra. *Newsletter for Birdwatchers* 41(4): 56.

Dhamankar, A. (2001b) Nesting of Indian Pitta (*Pitta brachyura*) recorded first time in Vidharbha. *Newsletter for Birdwatchers* 41(5): 70.

Dhamankar, A. (2003) Sarus arrival in Chandrapur, east Maharashtra. *Journal of Ecological Society* 16: 42–43.

Haribal, M. (1986) Occurrence of the Great Crested Grebe *Podiceps cristatus* (Linn.) at Tadoba, Maharashtra. *JBNHS* 83: 661.

Kasambe, R., Pimplapure, A., Wadatkar, J. and Pillarisett, A. (2005) Vulture notes from Vidarbha including Melghat and Tadoba Andhari Tiger Reserve. *Newsletter for Birdwatchers* 45(5): 77–78.

Pande, P. (2005) *National Parks and Sanctuaries in Maharashtra. Reference Guide. Vol. II. Individual Profile and Management Status*. Bombay Natural History Society, Mumbai. Pp. 531.

Rajkondawar, P.L. (1991) Tadoba National Park, Chandrapur: Checklist of Avifauna. Published by Dy. Conservator of Forests, Chandrapur. Pp. 10.

Shariff, I. (2009) Trip to Tadoba. *Pitta* 6(9): 1–4.

Srinivasulu, C., Srinivasulu, B., Vyas, R., Thakur, S., Mohapatra, P. & Giri, V. (2013) *Elachistodon westermanni*. In: IUCN 2014. IUCN Red List of Threatened Species. Version 2014.1. <[www.iucnredlist.org](http://www.iucnredlist.org)>. As downloaded on 02 July 2014.

Tuljapurkar, B. (1994) Magic moments – A Tadoba experience. *Sanctuary Asia* 14(5): 35–41.

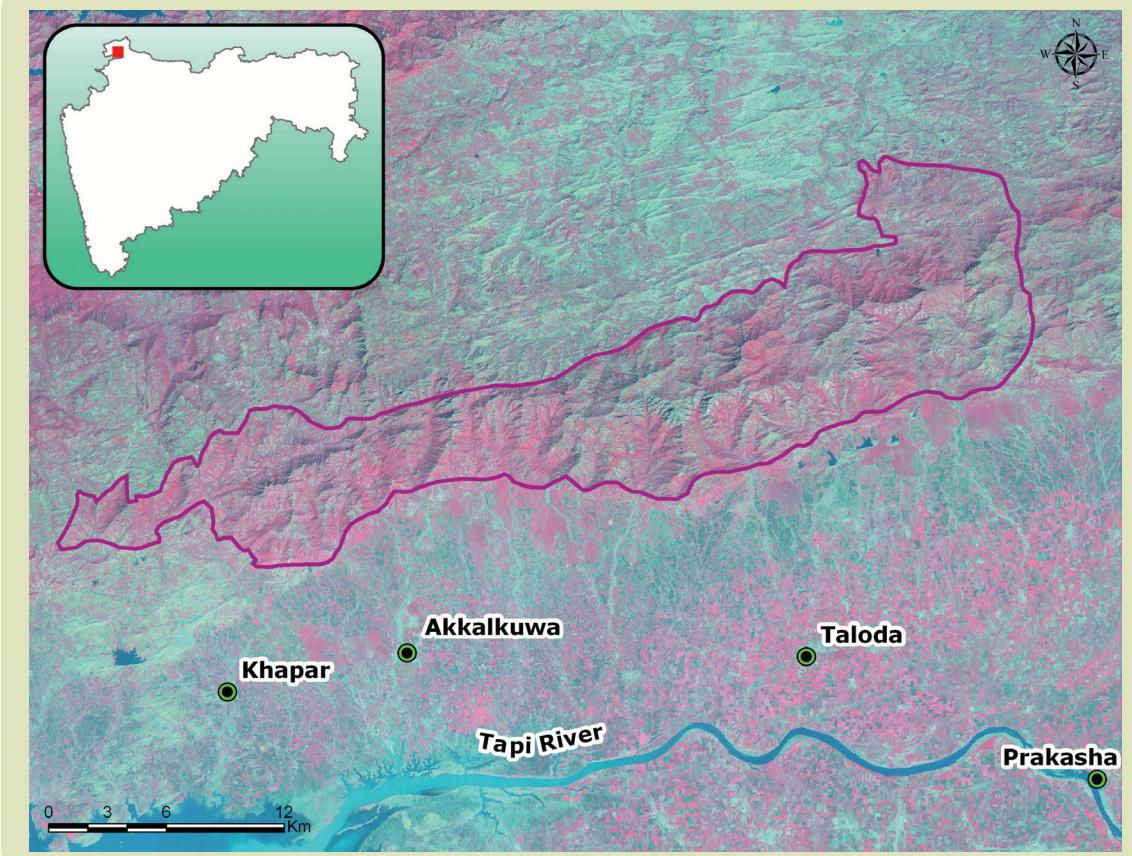
## TALODA RESERVE FOREST

<b>IBA Site Code</b>	: IN-MH-17
<b>District</b>	: Nandurbar
<b>Coordinates</b>	: 21° 37' 60" N, 74° 12' 00" E
<b>Ownership</b>	: State
<b>Area</b>	: 21,900 ha

<b>Altitude</b>	: 350–900 msl
<b>Rainfall</b>	: 900 mm
<b>Temperature</b>	: 8 °C to 43 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula
<b>Habitats</b>	: Tropical Dry Deciduous Forest

**IBA CRITERIA :** A1 (Threatened Species), A2 (Secondary Area s075: Central Indian Forests)

**PROTECTION STATUS :** Not officially protected.



### GENERAL DESCRIPTION

Taloda Reserve Forest is located in Taloda tehsil of Nandurbar district, south of the Narmada river and c. 60 km from the Gujarat border. The general topography of the area consists of steep hills with open as well as dense patches of Dry Deciduous forest. The Bheels and Pawaras, the dominant tribes in this area, have a rich cultural diversity. In some remote areas, they still lead their traditional way of life, untouched by modernity. They are totally dependent on forests for their day-to-day requirements. Taloda Reserve Forest became famous in 1999 when the Forest Owlet *Heteroglaux blewitti* was found here by Farah Ishtiaq (Ishtiaq 2000a). In 1998, some areas

near the Forest Owlet site were cleared for rehabilitation of tribals from the Sardar Sarovar dam site (Ishtiaq 2000a, b). The forest is Tropical Dry Deciduous type. The dominant species are Teak *Tectona grandis* and *Anogeissus latifolia*, with several associated species such as *Boswellia serrata*, *Mitragyna parvifolia*, *Haldina cordifolia*, *Madhuca indica*, and *Bombax ceiba*. Grasses like *Cymbopogon* are commonly found on the slopes.

### AVIFAUNA

Taloda forest range is one of the refuges of the Critically Endangered and endemic Forest Owlet *Heteroglaux blewitti*. The species was thought to be extinct, until its rediscovery



NANDKISHOR DUDHE

Taloda, the site where the Forest Owlet *Heteroglaux blewitti* was rediscovered, now faces a massive problem of encroachment for cultivation

in 1997 by King & Rasmussen (1998). Later, during a BNHS study, three pairs were recorded here in 2000 (Ishtiaq & Rahmani 2000). In the past, James Davidson had collected four specimens of Forest Owlet from Taloda tehsil (Davidson 1881). Recent surveys in 2004 and 2010 in this area could not locate the Forest Owlet despite extensive surveys (Jathar & Rahmani 2004, Jathar & Rahmani 2011, Jathar & Patil 2011).

Taloda is one of the few sites in India that come under the Secondary Area category of BirdLife International. Secondary Area is an area which supports one or more restricted-range species, but does not qualify as an Endemic Bird Area because the number of species entirely confined to it is less than two. The globally Threatened Greater Spotted Eagle *Clanga clanga* is also found here in winter. Taloda is one of the few sites where three Critically Endangered species are found.

### OTHER KEY FAUNA

The mammalian fauna of Taloda Reserve Forest includes Leopard *Panthera pardus*, Four-horned Antelope *Tetracerus*

#### CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Forest Owlet	<i>Heteroglaux blewitti</i>

#### ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
------------------	------------------------------

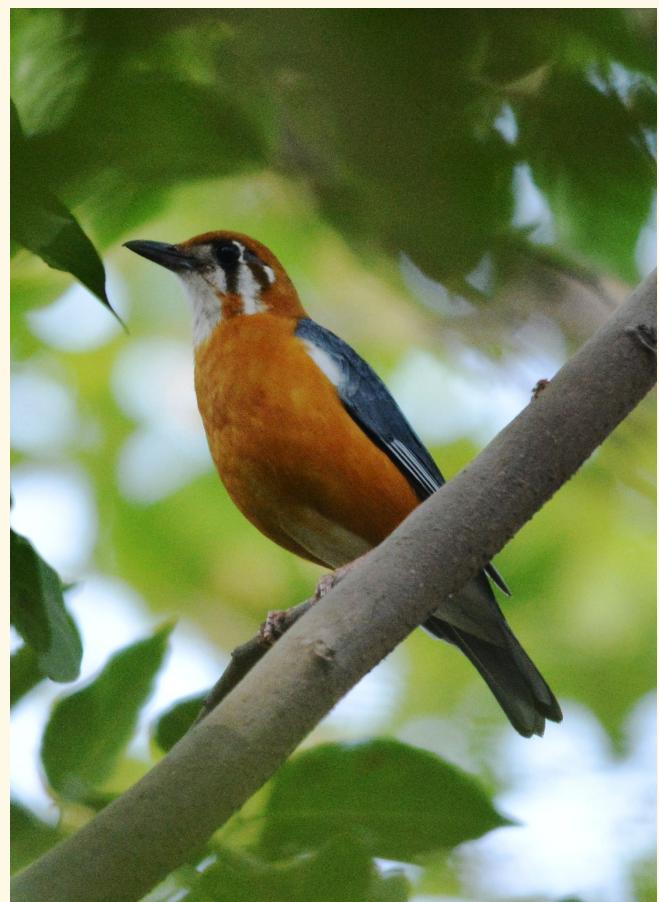
#### VULNERABLE

Greater Spotted Eagle	<i>Clanga clanga</i>
-----------------------	----------------------

#### SECONDARY AREA S075: CENTRAL INDIAN FORESTS

Forest Owlet	<i>Heteroglaux blewitti</i>
--------------	-----------------------------

*quadricornis*, Sloth Bear *Melursus ursinus*, Jungle Cat *Felis chaus*, Common Langur *Semnopithecus entellus*, and the Rufous-tailed Hare *Lepus nigricollis ruficaudatus*.



RAJU KASAMBE

Orange-headed Thrush *Zoothera citrina* is a resident of Taloda



The Critically Endangered Forest Owlet *Heteroglaux blewitti* is struggling to survive the onslaught of encroachment on its habitat

## LAND USE

- Forestry
- Agriculture

## THREATS AND CONSERVATION ISSUES

- Encroachment
- Grazing
- Illicit woodcutting
- Deliberate forest fires
- Rehabilitation of tribals from Sardar Sarovar Project.
- Roads

The major threat for the Forest Owlet is habitat degradation and destruction. In 1998, about 5,000 ha of plain forest area near the Forest Owlet site was cleared to rehabilitate displaced tribal communities from the Sardar Sarovar Project. About 500 families now live in this area and use the forest resources, adding to the burden on the rapidly disappearing habitat of the Forest Owlet (Ishtiaq 2000a, b). The tribals hunt owls and destroy their nests due to superstitious beliefs. Trade of owls is rampant in this area since 2000, to satisfy the demand from Gujarat. Owls are sacrificed in witchcraft during the Diwali festival (Girish Jathar, *pers. comm.*).

## KEY CONTRIBUTORS

Girish Jathar, Farah Ishtiaq.

## KEY REFERENCES

Davidson, J. (1881) Rough list of birds of Khandesh. *Stray Feathers* 10: 279–327.

Ishtiaq, F. (2000a) The enigma of the Forest Owlet. *Sanctuary Asia* XX: 34–37.

Ishtiaq, F. (2000b) The enigmatic Forest Owlet. *World Birdwatch* 22: 24–26.

Ishtiaq, F. and Rahmani, A.R. (2000) Further information on status and distribution of Forest Owlet (*Athene blewitti*). *Forktail* 16: 125–130.

Jathar, G.A. and Patil, D.N. (2011) Reassessment of the status of Forest Owlet in its known distribution and evaluation of conservation issues. Final Report. Foundation for Ecological Conservation and Sustainable Development, India. Published by Watershed Organization Trust, Pune. Pp. 48.

Jathar, G. and Rahmani, A.R. (2004) Ecological studies of the Forest Spotted Owllet *Athene (Heteroglaux) blewitti*. Final report. BNHS, Mumbai. Pp. 77.

Jathar, G.A. and Rahmani, A.R. (2011) Ecology of the Forest Owlet: A comprehensive study of the critically endangered Forest Owlet in Central India. Lap Lambert Academic Publishing GmbH & Co., Germany.

King, B.F. and Rasmussen, P.C. (1998) The rediscovery of the Forest Owllet *Athene (Heteroglaux) blewitti*. *Forktail* 14: 51–53.

## TANSA WILDLIFE SANCTUARY

**IBA Site Code :** IN-MH-18

**District :** Thane

**Coordinates :** 19° 31' 18" N, 73° 15' 36" E

**Ownership :** State

**Area :** 30,481 ha

**Altitude :** 70–300 msl

**Rainfall :** 3,000 mm

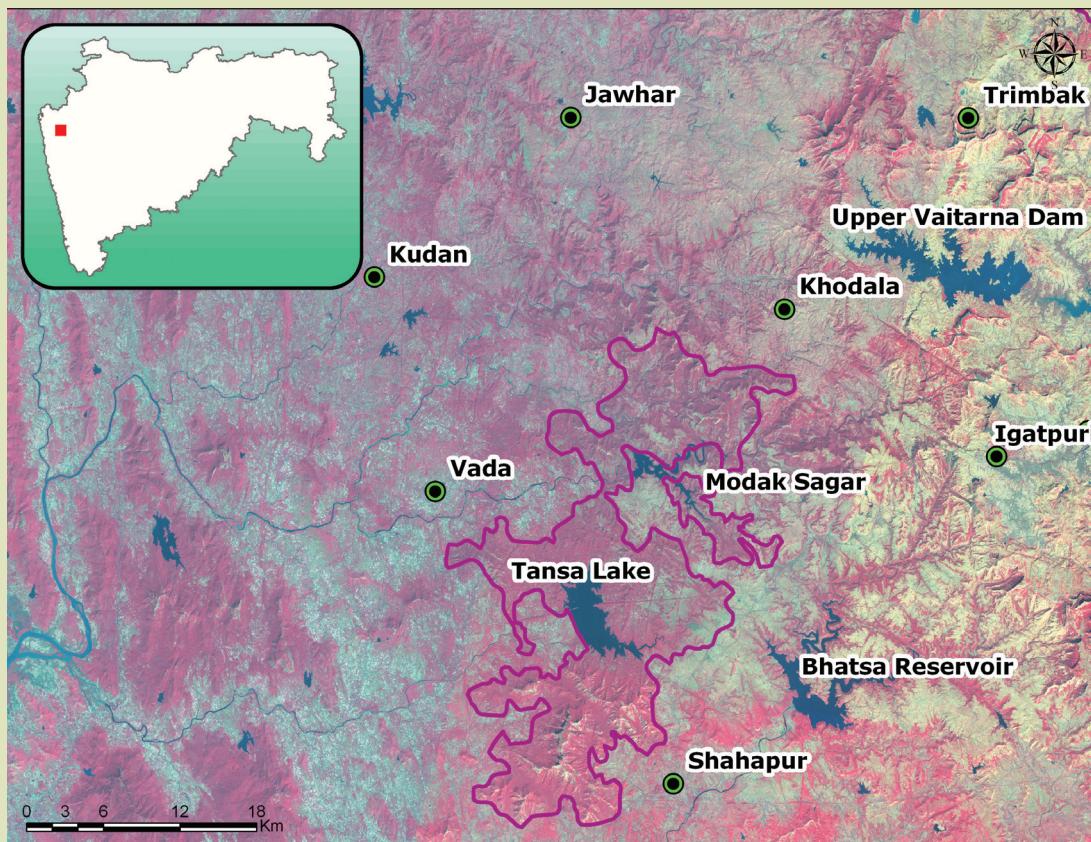
**Temperature :** 10 °C to 38 °C

**Biogeographic Zone :** Western Ghats

**Habitats :** Tropical Dry Deciduous Forest

**IBA CRITERIA :** A1 (Threatened species), A3 (Biome 11: Indo-Malayan Tropical Dry Zone)

**PROTECTION STATUS :** Wildlife Sanctuary, established June, 1970.



### GENERAL DESCRIPTION

Tansa Wildlife Sanctuary is located 90 km northeast of Mumbai (Bombay), in the foothills of the Sahyadris (Western Ghats). It extends over Wada, Shahapur, and Mokhada talukas of Thane district. It has two rivers, the Tansa and Vaitarna, and the sanctuary gets its name from the former, which divides it into two.

Tansa WLS forms the catchment area of Tansa Lake, along with the surrounding forests of Khardi, Vaitarna, Wada, and Shahapur Ranges. The reservoir on the River Tansa, occupying an area of c. 20 sq. km, is under the administration of Brihanmumbai Municipal Corporation (BMC). Tansa, Vaitarna, and Bhatsa reservoirs are the

major sources of drinking water for Mumbai and Thane.

Five revenue villages, geographically located within the sanctuary, are not part of the protected area. More than 100 villages are located on the periphery of the sanctuary, many of them dependent on it for livelihood.

Within Tansa WLS, there is a fort at Mahuli, situated on top of a 762 m hill, indicating the area's historical importance. The sanctuary has Southern Tropical Moist Deciduous Forest, with a few patches of Evergreen Forest. The dominant species are Teak *Tectona grandis*, Khair *Acacia catechuoides*, Kadam *Mitragyna parvifolia*, Haldū *Haldina cordifolia*, Mahua *Madhuca indica*, and Red Silk Cotton *Bombax ceiba*.

**CRITICALLY ENDANGERED**

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Forest Owlet	<i>Heteroglaux blewitti</i>

**VULNERABLE**

Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i> (?)
---------------------	-----------------------------------

**NEAR THREATENED**

Oriental Darter	<i>Anhinga melanogaster</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

**BIOME 11: INDO-MALAYAN TROPICAL DRY ZONE**

Red-naped (Black) Ibis	<i>Pseudibis papillosa</i>
Jungle Bush-quail	<i>Perdicula asiatica</i>
Indian Peafowl	<i>Pavo cristatus</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Yellow-legged Green-pigeon	<i>Treron phoenicopterus</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Mottled Wood-owl	<i>Strix ocellata</i>
Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocypterus birostris</i>
Black-rumped Flameback	<i>Dinopium benghalense</i>
Tawny Lark	<i>Galerida deva</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
Jungle Babbler	<i>Turdoides striatus</i>
Ashy Prinia	<i>Prinia socialis</i>
Jungle Prinia	<i>Prinia sylvatica</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>

**AVIFAUNA**

About 212 bird species have been recorded from Tansa (S. Laad, *pers. comm.* 2012; Maharashtra Forest Dept Checklist 1996, *unpubl.*). Besides the two Critically Endangered *Gyps* species of vultures, the Vulnerable Pallas's Fish-eagle

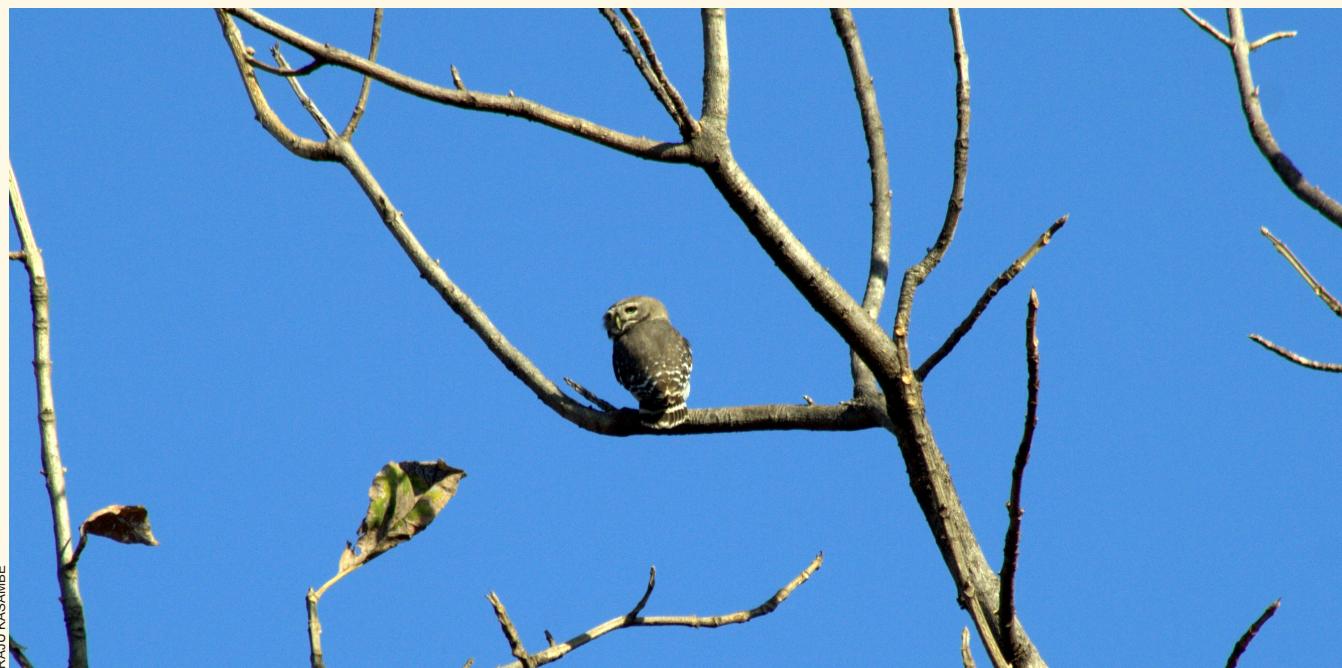
*Haliaeetus leucoryphus* is also seen here. However, there are no recent records of vultures in the last two years (S. Laad, *pers. comm.* 2012). Recently, the Critically Endangered Forest Owlet *Heteroglaux blewitti* has been sighted here (Laad and Dagale 2014). Sunil Laad in undertaking a survey with support from IBCN-BNHS for the species.

The site also qualifies for Biome 11 criteria, as 19 out of 59 species of this biome are easily seen here. If detailed studies are conducted, many more species would be added.

**OTHER KEY FAUNA**

Little work has been done on the fauna of Tansa WLS (Singh & Pradhan 1992). Tiger *Panthera tigris* was occasionally sighted, but there has been no report during the last 10 years. Two were sighted in Suryamal Range by tribals and forest authorities in 1986. The Leopard *Panthera pardus* is quite common. Other felids reported by Singh & Pradhan (1992) are the Indian Desert Cat *Felis silvestris*, Jungle Cat *F. chaus*, Leopard Cat *F. bengalensis*, and Rusty-spotted Cat *Prionailurus rubiginosus*. However, the sightings of Desert Cat and Rusty-spotted Cat need further confirmation. Other mammals present at Tansa are Golden Jackal *Canis aureus*, Striped Hyaena *Hyaena hyaena*, Wild Boar *Sus scrofa*, Four-horned Antelope *Tetracerus quadricornis*, Chital *Axis axis*, Sambar *Rucervus unicolor*, Barking Deer *Muntiacus muntjak*, Indian Mouse Deer *Moschiola indica*, and Black-naped Hare *Lepus nigricollis*. Indian Porcupine *Hystrix indica*, Ruddy Mongoose *Herpestes smithii*, Small Indian Civet *Viverricula indica*, and Indian Pangolin *Manis crassicaudata* are the common smaller mammals.

Among reptiles, Indian Pond Terrapin *Melanochelys trijuga*, Common Indian Monitor *Varanus bengalensis*,



Forest Owlet *Heteroglaux blewitti* has recently been found in Tansa



NEHA MUJUNDAR

The Tropical Dry Deciduous Forest habitat in Tansa

Indian Rock Python *Python molurus*, Trinket Snake *Elaphe helena*, and Rat Snake *Ptyas mucosus* are common.

As the sanctuary is a greatly disturbed by a mosaic of settlements and villages, it is degrading rapidly and many species mentioned above may no longer be present.

#### LAND USE

Catchment area of reservoirs

#### THREATS AND CONSERVATION ISSUES

Overgrazing

Illegal felling of trees

Expansion of agriculture

Poaching/hunting of birds and animals

Widening of highway passing through the sanctuary

Many roads link Tansa WLS to the Mumbai-Agra highway NH 2 and to railway lines, which facilitates the activities of the timber mafia. Illegally felled timber is smuggled out by these routes. Khair, needed for manufacturing *gutkha* (a mixture of *khair*, tobacco, slaked lime, and spices) is also smuggled out of the forests of Tansa, and is transported as far as northeast India. A nearby area was declared as an industrial zone, thus attracting outsiders who are putting pressure on the natural resources of the sanctuary.

In 2013, the Mumbai Metropolitan Region Development Authority (MMRDA) had planned to cut 3,027 full-grown trees, which form a canopy along the 20 km Shirasad-Ambadi road in the Bhiwandi-Vasai taluka in Thane district, to

convert the current two-lane road into a four-lane roadway. Both Tungareshwar WLS and Tansa WLS are on either side of the road, but the plan had no arrangement for an underpass or overpass to facilitate the movement of wild animals between the sanctuaries. In 2014, the Bombay High Court ordered a stay on this move of MMRDA.

As the road inside the sanctuary is under the control of the Brihanmumbai Municipal Corporation, there is very little check on the vehicles passing through, so many wildlife crimes remain undetected. Proximity to megacities and easy accessibility has increased the collection of natural produce and forest products, resulting in deterioration of habitat quality. The sanctuary is also riddled with human settlements and villages, making it extremely difficult for the Forest Department to manage, especially when they have limited resources and inadequate staff.

#### KEY CONTRIBUTORS

Sunil Laad, Raju Kasambe.

#### KEY REFERENCES

Laad, S. and Dagale, R. (2014) First report of Forest Owlet *Heteroglaux blewitti* from Tansa Wildlife Sanctuary (Western Ghats), Maharashtra, India. *JBNHS* 111(2): 134.

Navarro, A. (1977) Birdwatching at Tansa Lake. *Newsletter for Birdwatchers* 17(12): 7–9.

Singh, D.F. and Pradhan, M.S. (1992) Vertebrate fauna of Tansa Wildlife Sanctuary, Maharashtra. *Rec. Zool. Surv. India* 91(3–4): 449–470.

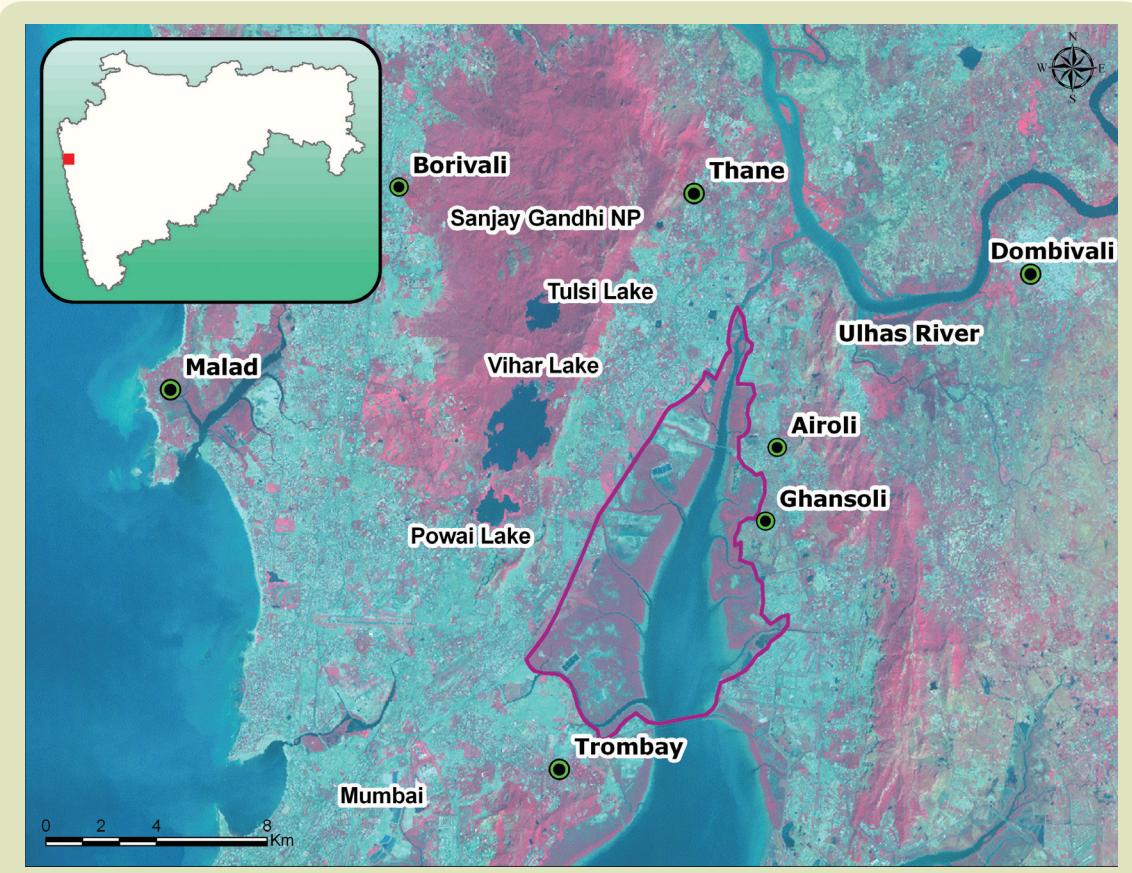
## THANE CREEK

<b>IBA Site Code</b>	: IN-MH-19
<b>District</b>	: Greater Mumbai, Thane, Navi Mumbai
<b>Coordinates</b>	: 19° 07' 30" N, 72° 57' 30" E
<b>Ownership</b>	: State, Private
<b>Area</b>	: 12,200 ha

<b>Altitude</b>	: 0 msl
<b>Rainfall</b>	: 2,293 mm
<b>Temperature</b>	: 17 °C to 35 °C
<b>Biogeographic Zone</b>	: Coasts
<b>Habitats</b>	: Littoral Forest, Mudflats

**IBA CRITERIA :** A1 (Threatened species), A4i ( $\geq 1\%$  of biogeographic population of waterbird), A4iii ( $\geq 20,000$  waterbirds)

**PROTECTION STATUS :** An area of 1,691 ha declared as Thane Creek Flamingo Sanctuary August 6, 2015.



### GENERAL DESCRIPTION

Thane Creek has been proposed as a potential Ramsar Site in India as it meets Ramsar Criteria 2 (wetland supports threatened ecological communities), Criteria 4 (wetland provides refuge during adverse conditions to threatened species), Criteria 5 (wetland regularly supports 20,000 or more waterbirds), and Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies), and for its high ecological values (Islam & Rahmani 2008).

Thane Creek is one of the largest in Asia and is located partly on the coastline of Mumbai metropolis. The east bank lies in Thane and Navi Mumbai districts, while the

west bank is in Greater Mumbai district. The creek runs c. 26 km north from Mumbai harbour before it joins Ulhas river through a small channel. There are several sources of fresh water for the creek, of which Ulhas river is the largest, followed by numerous drainage channels from various suburban areas of Mumbai, Navi Mumbai, and Thane.

The Forest Department, Government of Maharashtra, declared an area of 1,691 hectares (16.9 sq km) as Thane Creek Flamingo Sanctuary on August 6, 2015. It includes 896 ha mangrove cover along the western side of the creek (in Mulund, Vikhroli, Bhandup, KanjurMarg and Mandala areas plus 795 ha of creek area which is partly exposed during low tide. This is the area used

IN-MH-19



RAJU KASAMBE

Thane Creek is a refuge for thousands of flamingos for nearly six months of the year

by thousands of flamingos for resting during high tide. The site is composed of saltponds and stretches of mangroves. The saltpan lands are potential areas for mangrove development, and can easily be restored to their original mangrove habitats.

Considering the value of the adjoining areas in terms of bird habitat, the IBA can be extended to Uran on the eastern side and Sewree on the west. The area also includes Elephanta Island, which is an international tourist destination.

About 90 species of plants are recorded from this IBA. Three types of vegetation are recognized here: mangrove, mangrove associated species, and non-mangrove plants. Among mangroves, *Avicennia marina*, *A. officinalis*, *A. alba*, *Rhizophora mucronata*, and *Ceriops tagal* are the dominant species. Among the mangrove associates, *Acanthus ilicifolius*, *Aleuropus lagopoides*, *Sesuvium portulacastrum*, and *Salvadora persica* are dominant (Athalye & Quadros 2004).

## AVIFAUNA

Thane Creek is a very important wintering ground for waterbirds. It supports more than 100,000 birds during winter (Kulkarni 2000). These include the Lesser Flamingo

### VULNERABLE

Asian Woollyneck	<i>Ciconia episcopus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Indian Skimmer	<i>Rynchops albicollis</i>

### NEAR THREATENED

Painted Stork	<i>Mycteria leucocephala</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Lesser Flamingo	<i>Phoeniconaias minor</i>
Great Thick-knee	<i>Esacus recurvirostris</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>



RAJU KASAMBE

Thousands of gulls and waders winter in Thane Creek

*Phoeniconaias minor*, Greater Flamingo *Phoenicopterus roseus*, Asian Openbill *Anastomus oscitans*, White Stork *Ciconia ciconia*, Pied Avocet *Recurvirostra avosetta*, Eastern Golden Plover *Pluvialis dominica*, Ruddy Turnstone *Arenaria interpres*, and Dunlin *Calidris alpina*. Smaller waders, especially Little Stint *Calidris minutus* and Temminck's Stint *C. temminckii* are sometimes seen in tens of thousands. Raju Kasambe (*pers. obs.*) estimated 10,000 Lesser Flamingo in Thane Creek near Airoli bridge on March 24 and 26, 2013 along with thousands of Greater Flamingo and a few hundred Black-tailed Godwit *Limosa limosa*.

Deshmukh (1990) listed 146 bird species, Kulkarni (2000) reported 179 species from the middle to lower stretch of the creek, while Quadros (2001) observed 61 species in the intertidal region of the creek. Nitsure & Pejaver (2002) reported 69 species of birds from this area. This diversity of avifauna could be because the birds only feed in the mangrove ecosystem and are not directly affected by the water and sediment quality, but in the bargain they could be accumulating pollutants in their bodies which may prove detrimental in the long run (Athalye & Quadros 2004).

Thane Creek and its environs sometimes harbour unusual bird species. On June 4, 1970, a Least Frigatebird *Fregata ariel iredalei* was found on Mumbai beach. It was tagged at Aldabra Island on April 18, 1969 (Ali 1970). Similarly, a Pallas's Fish-eagle *Haliaeetus leucoryphus* was sighted near Vihar Lake (Bannerjee 1984), c. 10 km from Thane Creek. An Indian Skimmer *Rynchops albicollis* was sighted here on October 14, 2012 (Abhijeet Pachpande, *pers. comm.* 2012).

In August 2015, an exhausted Brown Noddy *Anous stolidus* was rescued from here by Vivek Sethia (*pers. comm.*) of ResQink Association of Wildlife Welfare (RAWW) organization. This is possibly the first record of the species from Mumbai.

This site was selected as an IBA mainly because of the huge congregations of waterbirds (A4 criteria). Many species occur much above their 1% biogeographic population threshold determined by Wetlands International (2012). Detailed studies on the birdlife of this important site are urgently required.

### OTHER KEY FAUNA

About 27 species of phytoplankton were recorded from this area (Quadros 2001). About 33 species of reptiles, 13 species of crabs, 7 species of prawns, 23 species of butterflies, 21 species of fish, and mammals like the Jungle Cat *Felis chaus*, Golden Jackal *Canis aureus*, and Common Mongoose *Herpestes edwardsi* also inhabit the area (Deshmukh 1990, Kulkarni 2000). The Endangered Green Turtle *Chelonia mydas* was also recorded from here (Varad Giri, *pers. comm.* 2002).

### LAND USE

- Dumping waste and effluents
- New bridges and road construction
- Industrial development
- Land fills
- Sewage treatment facilities

### THREATS AND CONSERVATION ISSUES

- Industrialization
- Urbanization
- Dumping of solid waste
- Seepage of organic and inorganic waste
- Logging
- Illicit liquor production
- Oil spills
- Siltation
- Illegal sand mining



Flocks of Black-tailed Godwit *Limosa limosa* winter at Thane Creek



RAJU KASAMBE

Whiskered Terns *Chlidonias hybrida* are seen in good numbers in Thane Creek

The biggest threat to the mangroves in Thane Creek is reclamation of land for housing, slums, industries, and dumping of debris. The area receives high loads of sewage, effluents, and bacterial infection. The water is highly contaminated with oil and grease due to its proximity to two ports. The oil slick causes particular trouble to waterbirds. Slums growing around the creek are dependent on the mangroves for fuel wood, and an estimated 400 metric tons of mangroves are cut every year for this purpose. About 3,000 metric tons of solid waste is dumped along the creek every day. Due to heavy siltation, the creek is becoming shallower. Poaching by local fishermen is also considerable, and the birds thus taken are usually eaten locally. In December 2011, the State Forest Department decided to declare the Thane Creek as a Flamingo Sanctuary for the protection of birds and their habitats.

#### KEY CONTRIBUTORS

Vivek Kulkarni, Debi Goenka, Raju Kasambe.

#### KEY REFERENCES

Ali, R. (1970) Occurrence of Least Frigate Bird (*Fregata ariel iredalei* Mathews) in Bombay. *JBNHS* 67(3): 569–570.

Athalye, R.P. and Quadros, G. (2004) Deterioration of Thane Creek ecosystem. In: *Proceedings of the “Pollution of Water Bodies in Urban Areas”*. Vidya Prasarak Mandal’s B.N. Bandodkar College of Science, Thane (India).

Bannerjee, D.P. (1984) Sighting of Ringtailed Fishing Eagle at Vihar Lake, Greater Bombay. *JBNHS* 81(2): 468–469.

Deshmukh, S.V. (1990) Ecological Studies of Mangroves in Bombay. Ph.D. Thesis. University of Bombay. Pp. 153.

Islam, M.Z. and Rahmani, A.R. (2008) *Potential and Existing Ramsar Sites in India*. Indian Bird Conservation Network, BNHS, BirdLife International and Royal Society for the Protection of Birds. Oxford University Press. Pp. 592.

Kulkarni, V.S. (2000) *Godrej: A Symbiosis of Industry and Nature: Flora and Fauna of Pirojshanagar, an Eastern Suburb of Mumbai*. Soonabai Pirojsha Godrej Foundation and Bombay Natural History Society, Mumbai. Pp. 138.

Nitsure, S.R. and Pejaver, M. (2002) Species diversity of Avifauna at Thane Creek near Rutuchakra Nature Park. *Proceedings of the National Seminar on Creeks, Estuaries and Mangroves – Pollution and Conservation*. Pp. 276–282.

Quadros, G. (2001) Study of Intertidal Fauna of Thane Creek. Ph.D. Thesis. University of Mumbai, Mumbai.

Wetlands International (2012) *Waterbird Population Estimates - Fifth Edition*. Wetlands International, Wageningen, The Netherlands. Pp. 239.

## TORANMAL RESERVE FOREST

**IBA Site Code** : IN-MH-20

**District** : Nandurbar

**Coordinates** : 21° 45' 00" N, 74° 30' 00" E

**Ownership** : State

**Area** : 26,000 ha

**Altitude** : 350–1,200 msl

**Rainfall** : 900 mm

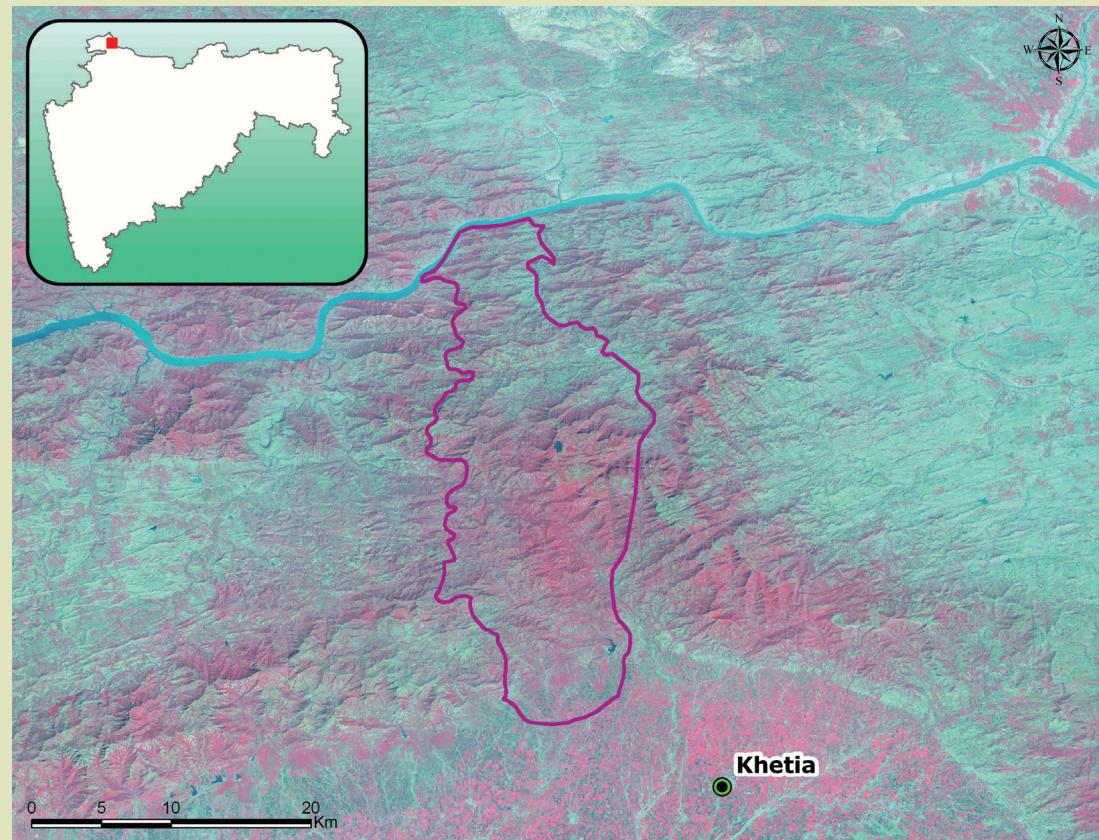
**Temperature** : 10 °C to 48 °C

**Biogeographic Zone** : Deccan Peninsula

**Habitats** : Tropical Dry Deciduous Forest

**IBA CRITERIA** : A1 (Threatened species), A2 (Secondary Area s075: Central Indian Forests),  
A3 Biome 11 (Indo-Malayan Tropical Dry Zone)

**PROTECTION STATUS** : Not officially protected.



### GENERAL DESCRIPTION

Toranmal Reserve Forest is located in Shahada tehsil of Nandurbar district, Maharashtra. Situated south of the Narmada river, c. 100 km from the Gujarat border, this area is situated on the Deccan Plateau of central India.

The general topography of the area is undulating hills with open as well as dense patches of Dry Deciduous Forest. There are 46 villages in and around Toranmal RF, and the local population depends entirely on the forest for livelihood. Nine different tribal communities reside in and around the reserve forest. Pawara, Bheel, Nahal, and Rathod tribals are the dominant tribal communities who have been living in these forests for hundreds of years.

Toranmal RF has two water reservoirs which support the surrounding villages and wildlife. However, the area experiences acute water shortage during the hot, dry summer months.

This IBA has Tropical Dry Deciduous Forest. About 225 species of plants are reported in the Forest Department checklist. The dominant species are Teak *Tectona grandis*, Salai *Boswellia serrata*, Kadam *Mitragyna parvifolia*, Mahua *Madhuca indica*, and Red Silk Cotton *Bombax ceiba*.

### AVIFAUNA

Davidson (1881) mentioned the rich bird diversity of this region. He had recorded c. 294 species of birds from Western

IN-MH-20

Khandesh. He also recorded the Green Munia *Amandava formosa*, Sykes's Nightjar *Caprimulgus mahrattensis*, Blue-cheeked Bee-eater *Merops persicus*, Spot-billed Pelican *Pelecanus philippensis*, Sociable Lapwing *Vanellus gregarius*, Lesser Florican *Sypheotides indicus*, Great Indian Bustard *Ardeotis nigriceps*, and Forest Owlet *Heteroglaux blewitti*. Due to the increasing human population, some of these birds have been eliminated from Western Khandesh.

Toranmal Reserve Forest is considered to be one of the last refuges of the Critically Endangered and endemic Forest Owlet. This species was considered extinct until 1997, when it was rediscovered by Pamela Rasmussen and Ben King (King & Rasmussen 1998). Since 1999, the BNHS is carrying out ecological studies on this bird (Ishtiaq & Rahmani 2000, Ishtiaq & Rahmani 2005, Jathar & Rahmani 2011). In a recent study, 258 species of birds were recorded here (Jathar & Rahmani 2004, Jathar 2006). A recent status assessment of the species reveals that 29% of the forest in Toranmal has been depleted. Of the 14 breeding adult Forest Owlets, only one pair could be located after intensive search in two seasons (Jathar & Patil 2011). Jathar & Rahmani (2012) studied the foraging, nesting, and roosting habitats of Forest Owlet here. They found that the owlets utilize mature and old forests where taller trees with larger diameter are readily available with suitable nest cavities away from human disturbance.

The presence of the Forest Owlet was reason enough to designate this area as an IBA. Along with Taloda, Toranmal is one of the few sites in India that come under the Secondary Areas category of BirdLife International (undated) and Stattersfield *et al.* (1998). Secondary Area is an area which supports one or more restricted-range species, but does not qualify as an Endemic Bird Area because fewer than two species are entirely confined to it.

The remnant forest of Western Khandesh represents the type that was present a hundred years ago. Most of the rare species mentioned by Davidson (1881) are no longer found here, but even so birds of Tropical Dry Deciduous Forest are found. Of the 59 species of Biome 11 (Indo-Malayan Tropical Dry Zone) identified by BirdLife International (undated), 27 have already been seen here. Therefore, this site qualifies for A3 criteria also.

## OTHER KEY FAUNA

Studies conducted by the BNHS have revealed eight species of rodents, three of shrews, five of lizards and skinks, four of geckos, and five of amphibians. Large mammals include Leopard *Panthera pardus*, Golden Jackal *Canis aureus*, Four-horned Antelope *Tetracerus quadricornis*, Sloth Bear *Melursus ursinus*, and Striped Hyena *Hyaena hyaena*. Rufous-tailed Hare *Lepus nigricollis ruficaudatus* is quite common. Jathar (2006) and Jathar & Rahmani (2004) reported 26 species of mammals, 28 species of reptiles, and

CRITICALLY ENDANGERED	
White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Forest Owlet	<i>Heteroglaux blewitti</i>
ENDANGERED	
Egyptian Vulture	<i>Neophron percnopterus</i>
VULNERABLE	
Greater Spotted Eagle	<i>Clanga clanga</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>
Green Munia (old record)	<i>Amandava formosa</i>
NEAR THREATENED	
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Pallid Harrier	<i>Circus macrourus</i>
Laggar Falcon	<i>Falco jugger</i>
Black-tailed Godwit	<i>Limosa limosa</i>
River Tern	<i>Sterna aurantia</i>
European Roller	<i>Coracias garrulus</i>
SECONDARY AREA S075: CENTRAL INDIAN FORESTS	
Forest Owlet	<i>Heteroglaux blewitti</i>
BIOME 11: INDO-MALAYAN TROPICAL DRY ZONE	
Red-naped (Black) Ibis	<i>Pseudibis papillosa</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Painted Francolin	<i>Francolinus pictus</i>
Rain Quail	<i>Coturnix coromandelica</i>
Jungle Bush-quail	<i>Perdicula asiatica</i>
Indian Peafowl	<i>Pavo cristatus</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Yellow-legged Green-pigeon	<i>Treron phoenicopterus</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocyceros birostris</i>
Yellow-crowned Woodpecker	<i>Dendrocopos mahrattensis</i>
Black-rumped Flameback	<i>Dinopium benghalense</i>
White-naped Woodpecker	<i>Chrysocolaptes festivus</i>
Ashy-crowned Sparrow-lark	<i>Eremopterix griseus</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Black-headed Cuckooshrike	<i>Coracina melanoptera</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
White-browed Fantail	<i>Rhipidura aureola</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Jungle Babbler	<i>Turdooides striatus</i>
Ashy Prinia	<i>Prinia socialis</i>
Jungle Prinia	<i>Prinia sylvatica</i>
Green Munia (?)	<i>Amandava formosa</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>

43 species of butterflies from Toranmal RF. Meshram (2011) reported 117 species of spiders belonging to 20 families and 55 genera in the IBA.

Patil *et al.* (2012) found five species of land molluscs, all gastropods, in Toranmal area during a two-year study (December 2006 to November 2008), belonging to five genera and three families, including two slugs and three snails. The main taxa were *Laevicaulis alte*, *Semperula*



GAJANAN WAGH

Toranmal supports a small population of the Critically Endangered Forest Owlet *Heteroglaux blewitti*

*maculata*, *Cerastus moussonianus*, *Ariophanta laevipes*, and *Macrochlamys indica*.

#### LAND USE

- Forestry
- Agriculture
- Small irrigation projects

#### THREATS AND CONSERVATION ISSUES

- Encroachment
- Grazing
- Illicit wood cutting
- Deliberate forest fires
- Poor management practices by Forest Department
- Myths and misconceptions among tribals
- Use of pesticides and rodenticides in cultivation

Toranmal Reserve Forest is under tremendous human pressure. It suffers from the usual problems of a typical Indian forest: overgrazing by livestock, illicit cutting of trees, encroachment, fires set intentionally by tribals and graziers for good growth of grass, and destruction of large trees in the name of collection of minor forest products. The remaining Forest Owlet population is under intense poaching pressure by tribals. It was observed that the local tribals utilize owl eggs and body parts for witchcraft and other rituals (Jathar & Rahmani 2004). In 2010, there was major encroachment by locals and also people from nearby Madhya Pradesh (Vinod Patil, *pers. comm.* 2012).

Another long-term threat is the encroachment around the Forest Owlet area by tribals for cultivation. Forest management practices such as removal of bamboo and afforestation of exotic species in the Forest Owlet area may also significantly affect the Forest Owlet habitat. Scientific management of Toranmal RF is a pressing need. After the

enactment of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (also called the Forest Rights Act), encroachments have increased many fold. Since 2006, there has been 29% loss in vegetation.

It is strongly recommended that any further deforestation in the name of the Forest Rights Act should be stopped at once, and this important Forest Owlet habitat should be declared as a Community Reserve, involving the local people including tribals for the protection of its biodiversity, especially the Forest Owlet. Effective environmental awareness programmes should be started among the tribals to wean them away from killing this Critically Endangered bird. Perhaps an alternative to their customary practices should be found.

#### KEY CONTRIBUTORS

Girish Jathar, Raju Kasambe, Vinod Patil.

#### KEY REFERENCES

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project Briefing Book*. BirdLife International, Cambridge, UK. Unpubl.

Davidson, J. (1881) Rough list of birds of Khandesh. *Stray Feathers* 10: 279–327.

Ishtiaq, F. and Rahmani, A.R. (2000) Further information on status and distribution of Forest Owlet (*Athene blewitti*). *Forktail* 16: 125–130.

Ishtiaq, F. and Rahmani, A.R. (2005) The Forest Owlet *Heteroglaux blewitti*: vocalization, breeding biology and conservation. *Ibis* 147(1): 197–205.

Jathar, G. (2006) Ecology and behaviour of the Forest Owlet *Athene (Heteroglaux) blewitti*. Ph.D. Thesis. Mumbai University. Pp. 179.

Jathar, G.A. and Patil, D.N. (2011) Reassessment of the status of Forest Owlet in its known distribution and evaluation of conservation issues. Final Report. Foundation for Ecological Conservation and Sustainable Development, India. Watershed Organization Trust, Pune. Pp. 48.

Jathar, G. and Rahmani A.R. (2004) Ecological studies of the Forest Spotted Owlet *Athene (Heteroglaux) blewitti*. Final Report. Bombay Natural History Society, Mumbai, India. Pp. 77.

Jathar, G. and Rahmani A.R. (2011) *Ecology of the Forest Owlet*. LAP Lambert Academic Publishing, Germany. Pp. 204.

Jathar, G. and Rahmani A.R. (2012) Habitat utilization by Forest Owlet *Heteroglaux blewitti* in Toranmal Reserve Forest, India. *Journal of Care4Nature* 1(1): 18–30.

King, B.F. and Rasmussen, P.C. (1998) The rediscovery of the Forest Owlet *Athene (Heteroglaux) blewitti*. *Forktail* 14: 51–53.

Meshram, A. (2011) Spiders (Arachnida: Araneae) from Toranmal Sanctuary, Maharashtra, India. *E-International Scientific Research Journal* 3(4): 326–334.

Patil, J.V., Ekhande, A.P., and Padate, G.S. (2012) A study of terrestrial molluscs with respect to their species richness, relative abundance and density in Toranmal Reserve Forest, North Maharashtra, India. *European Journal of Zoological Research* 1(2): 26–30.

Stattersfield, A.J., Crosby, M.J., Long, A.J., and Wege, D.C. (1998) *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. BirdLife Conservation Series No. 7. BirdLife International, Cambridge, UK. Pp. 846.

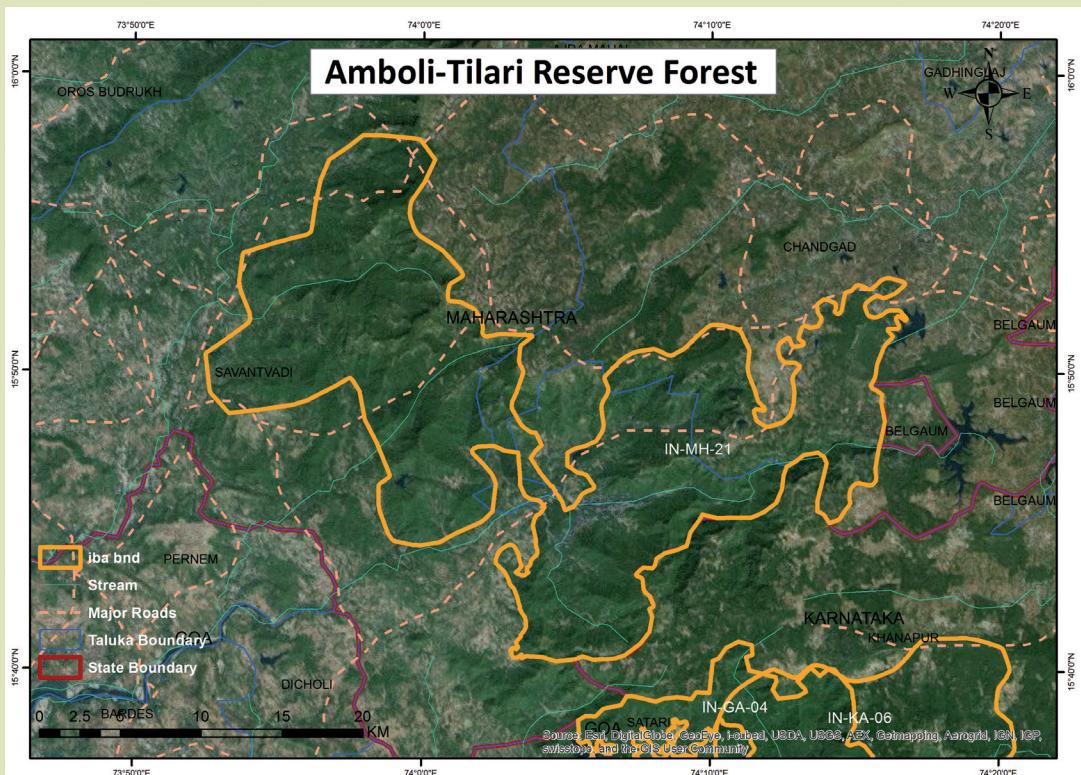
## AMBOLI-TILARI RESERVE FOREST

<b>IBA Site Code</b>	: IN-MH-21
<b>State</b>	: Maharashtra
<b>District</b>	: Sindhudurg, Kolhapur
<b>Coordinates</b>	: 15° 56' 0" N, 74° 12' 0" E
<b>Ownership</b>	: State
<b>Area</b>	: c. 30,000 ha
<b>Altitude</b>	: 700–1,100 msl

<b>Rainfall</b>	: 3,500 mm
<b>Temperature</b>	: 6 °C to 36 °C
<b>Biogeographic Zone</b>	: Western Ghats
<b>Habitat</b>	: Southern Semi-evergreen Forest, Southern Moist Mixed Deciduous Forest, Southern Evergreen Forest, Freshwater Wetland

**IBA CRITERIA:** A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest, Biome 11: Indo-Malayan Tropical Dry Zone)

**PROTECTION STATUS:** Reserve Forest, Ecosensitive Zone.



### GENERAL DESCRIPTION

Tilari Reserve Forest (TRF) is situated on the border of Kolhapur and Sindhudurg districts of Maharashtra, adjacent to Belgaum district of Karnataka. Radhanagari Wildlife Sanctuary and Sahyadri Tiger Reserve are situated on the northern side of Tilari RF, and Bondla Wildlife Sanctuary, Bhagvan Mahavir Wildlife Sanctuary, Dandeli Anshi National Park, and Dandeli Wildlife Sanctuary on the southern side. Tilari is thus a corridor between these protected areas of the three states of Maharashtra, Karnataka, and Goa.

The terrain is undulating with steep escarpments and rocky outcrops on hilltops, and covered with dense forest. Besides, it has small and large dams, notable among them Tilari Dam, most of them surrounded by forest. The small dams are used for irrigation in agricultural fields, whereas Tilari Dam provides water for drinking and industrial use in North Goa. This area is rich in bauxite ore and basalt rock, and mining activities have been reported from many sites.

The forest types are Southern Semi-evergreen, Southern Moist Mixed Deciduous, and Southern Evergreen Forests. Some tree species of the forest are *Memecylon umbellatum*,

*Terminalia chebula*, *Careya arborea*, and *Lagerstroemia microcarpa*. Fruiting trees and shrubs like *Syzygium cumini*, *Ficus racemosa*, and *Carissa* spp. are found almost all over, attracting many frugivorous birds and mammals. Karvi *Carvia callosa*, a widespread flowering plant in this area, serves as a source of food for a multitude of herbivores.

### AVIFAUNA

About 170 bird species have been recorded from the forest (Amol Lokhande, *pers. comm.* 2012). The globally threatened Nilgiri Wood-pigeon *Columba elphinstonii* is seen here in small numbers, especially during the fruiting season. Also the Western Ghats endemics – Malabar Lark *Galerida malabarica*, which breeds here on laterite plateaus, Indian Rufous Babbler *Turdoides subrufus*, Malabar Parakeet *Psittacula columboides*, Malabar Trogan *Harpactes fasciatus*, and Heart-spotted Woodpecker *Hemicircus canente* can be seen.

The site represents Biome10 (Indian Peninsula Tropical Moist Forest). BirdLife International (undated) has listed 15 species in this biome, out of which five are found here. Many species of Biome 11 (Indo-Malayan Tropical Dry Zone) are also seen, especially at lower elevations where this site merges with the Deccan Plateau. Biome 11 includes a wide range of habitats, including forests and open country.

During winter, many Himalayan forest birds are found here. Indian Blue Robin *Luscinia brunnea*, belonging to Sino-



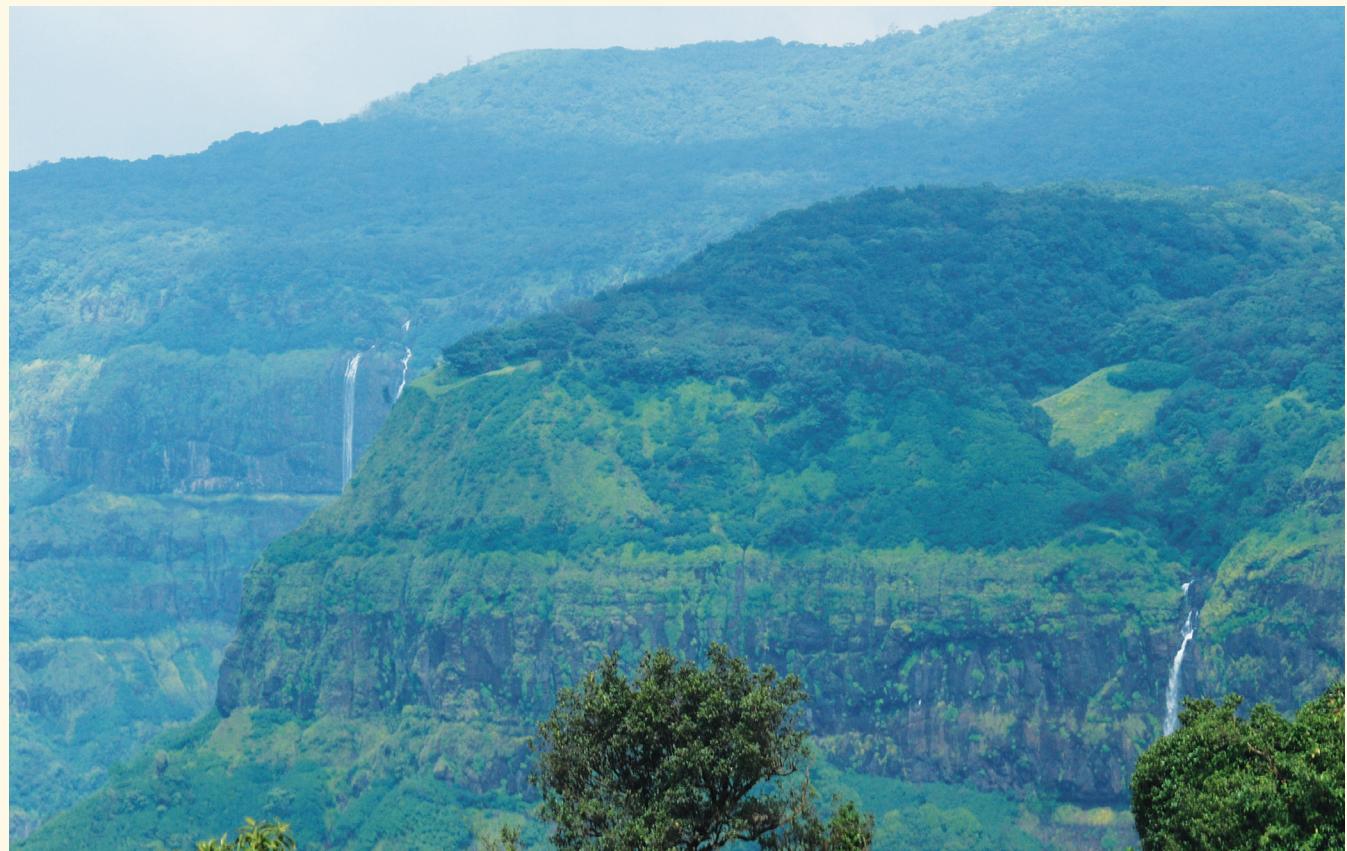
Amboli Bush Frog *Pseudophilautus amboli* was first described from Amboli area

IN-MH-21

VARUN SATOSE

Tropical Temperate Forest (Biome 7), has been seen here.

Some interesting species such as the Ceylon Frogmouth *Batrachostomus moniliger*, Amur Falcon *Falco amurensis*, and Indian Blue Robin *Luscinia brunnea* have been observed from this area (Amol Lokhande, *pers. comm.* 2012). Yellow-browed Bulbul *Iole indica*, Dusky Eagle Owl *Bubo coromandus*, Great Pied Hornbill *Buceros bicornis*, Black Bulbul *Hypsipetes leucocephalus*, Speckled Piculet *Picumnus*



LAXMAN GOSAVI

Amboli-Tilarí has evergreen forest and many perennial waterfalls

**CRITICALLY ENDANGERED**

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>

**ENDANGERED**

Egyptian Vulture	<i>Neophron percnopterus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

**VULNERABLE**

Indian Spotted Eagle	<i>Clanga hastata</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>
Bristled Grassbird	<i>Chaetornis striatus</i>
Indian Broad-tailed Grass-warbler	<i>Schoenicola platyurus</i>

**NEAR THREATENED**

River Tern	<i>Sterna aurantia</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

**ENDEMIC BIRD AREA 123: WESTERN GHATS**

Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>
Malabar (Blue-winged) Parakeet	<i>Psittacula columboidea</i>
Malabar Grey Hornbill	<i>Ocypterus griseus</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Small Sunbird	<i>Leptocoma minima</i>

*innominatus*, and Malabar Lark *Galerida malabarica* are commonly seen.

**OTHER KEY FAUNA**

This area is well known for its Gaur *Bos gaurus* population. Other mammal species include Tiger *Panthera tigris*, Leopard *P. pardus*, Leopard Cat *Prionailurus bengalensis*, Slender Loris *Loris tardigradus*, Mouse Deer *Moschiola indica*, and the elusive nocturnal Indian Pangolin *Manis crassicaudata*.

There are some endemic and threatened species of reptiles and amphibians, notably the Malabar Pit Viper *Trimeresurus malabaricus*, Deccan Ground Gecko *Geckoella deccanensis*, Gunther's Cat Skink *Ristella guntheri*, Beddome's Lacerta *Ophisops beddomei*, and amphibians such as *Ramanella* sp., Bombay Bush Frog *Philautus bombayensis*, and Humayun's Wrinkled Frog *Nyctibatrachus humayuni* (Sameer Bajaru & Rahul Khot, *pers. comm.*). The Critically Endangered Amboli Bush Frog *Pseudophilautus amboli* is found here (Biju 2004).

Amboli Tilari area is also home to more than 200 species of butterflies, many of which are endemic to the Western Ghats (Rahul Khot, *pers. comm.* 2012). Bharmal *et al.* (2011) reported the occurrence of 107 species and sub-species of butterflies during a study conducted during 2008–2010. In a study conducted during 2011–2013, Koparde *et al.* (2014) found 60 species of Odonates in Amboli-Parpoli and Verle villages.

**BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST**

Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Malabar Whistling-thrush	<i>Myophonus horsfieldii</i>
Indian Scimitar-babbler	<i>Pomatorhinus horsfieldii</i>
Loten's Sunbird	<i>Cinnyris lotenius</i>

**BIOME 11: INDO-MALAYAN TROPICAL DRY ZONE**

Jungle Bush-quail	<i>Perdicula asiatica</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Black-rumped Flameback	<i>Dinopium benghalense</i>
Malabar Lark	<i>Galerida malabarica</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Rufous-bellied Babbler	<i>Dumetia hyperythra</i>
Ashy Prinia	<i>Prinia socialis</i>
Jungle Prinia	<i>Prinia sylvatica</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>

**LAND USE**

- Agriculture
- Mining
- Reservoirs

**THREATS AND CONSERVATION ISSUES**

- Bauxite mining, a major threat to wildlife corridor
- Irrigation projects
- Encroachment
- Poaching
- Grazing

**KEY CONTRIBUTORS**

Amol Lokhande, Sameer Bajaru, Rahul Khot.

**KEY REFERENCES**

Bharmal, D.L., Aland, S.R., Mamlayya, A.B., and Bhawane, G.P. (2011) Butterflies of Amboli Reserved Forest Western Ghats Maharashtra. *Electronic Journal of Environmental Sciences* 4: 109–112.

Biju, S.D. (2004) *Pseudophilautus amboli*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Downloaded on 30/11/2012.

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project Briefing Book*. BirdLife International, Cambridge, UK. Unpubl.

Koparde, P., Mhaske, P., and Patwardhan, A. (2014) New records of dragonflies and damselflies (Insecta: Odonata) from the Western Ghats of Maharashtra, India. *Journal of Threatened Taxa* 6(5): 5744–5754.

# CHANDOLI NATIONAL PARK

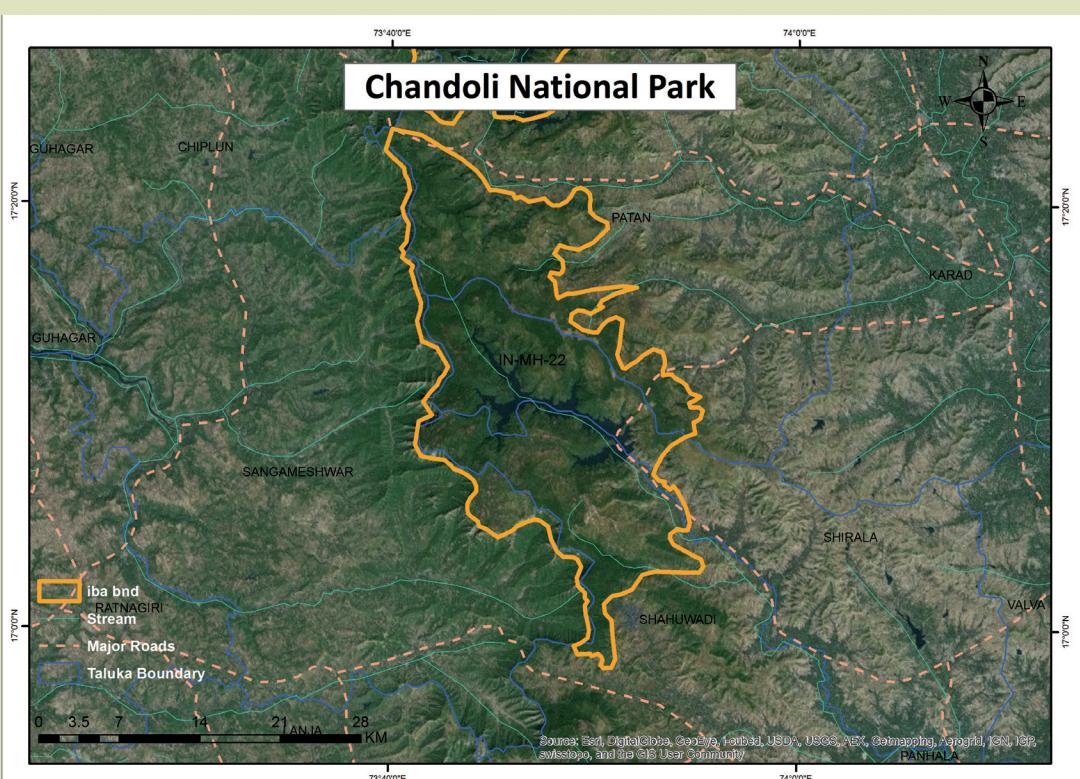
IN-MH-22

<b>IBA Site Code</b>	: IN-MH-22
<b>State</b>	: Maharashtra
<b>District</b>	: Sangli, Kolhapur, Ratnagiri
<b>Coordinates</b>	: 21° 45' 00" N, 74° 30' 00"E
<b>Ownership</b>	: State
<b>Area</b>	: 31,767 ha

<b>Altitude</b>	: 589–1,044 msl
<b>Rainfall</b>	: 3,500 mm
<b>Temperature</b>	: 6 °C to 37 °C
<b>Biogeographic Zone</b>	: Western Ghats
<b>Habitat</b>	: Tropical Dry Evergreen Forest, Tropical Moist Deciduous Forest

**IBA CRITERIA:** A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats)

**PROTECTION STATUS:** National Park, declared May, 2004. Included in Sahyadri Tiger Reserve, January 5, 2010.



## GENERAL DESCRIPTION

Chandoli National Park lies in the catchment area of Warna Dam, straddling Vasant Sagar Reservoir. The backwaters of the dam stretch across 30 km in an east-west direction. The dam and the waterbody have created a boundary for the park on the eastern side, while the steep hills of the Western Ghats protect the western, northern, and southern sides, making it remote and fairly inaccessible.

Chandoli National Park is located in Shirala and Sahuwadi tehsils of Sangli and Kolhapur districts respectively, in western Maharashtra, and extends westwards till Ratnagiri district. Chandoli NP lies between Koyna Wildlife Sanctuary and Radhanagari Wildlife Sanctuary, and is now part of the

Sahyadri Tiger Reserve. Sahyadri Tiger Reserve (STR) includes the northern and southern catchment areas of Warna Dam.

Historical sites in the Park include the 17th century Prachitgad and Bhairavgad forts of the Maratha kings Shivaji Maharaj and his son Sambhaji Maharaj.

Flat topped mountains, rocky, lateritic plateaus called *sadas*, with hardly any vegetation, and large boulders and caves are typical of the terrain of Chandoli NP.

The forest types seen here are a mix of Western Tropical Hill Forest, West Coast Semi-evergreen Forest, and Southern Moist Mixed Deciduous Forest. In the dwarf evergreen forests, tree species commonly seen are Anjani or Ironwood *Memecylon umbellatum*, Jamun *Syzygium cumini*,



ROHAN BHATE

Tropical Moist Deciduous Forest habitat of Chandoli

Pisa *Actinodaphne angustifolia*, Fig *Ficus glomerata*, Rose Sandalwood *Olea dioica*, Spiny Kino or Katak *Bridelia retusa*, Nana *Lagerstroemia lanceolata*, Kinjal *Terminalia paniculata*, Kokum *Garcinia indica*, and Freshwater Mangrove or Phanasi *Carallia brachiata*. Other trees dominating the landscape include Indian Laurel or Ain *Terminalia tomentosa*, Indian Gooseberry or Amla *Emblica officinalis*, Devil's Fig or Umbar *Ficus hispida*, and Chebulic Myrobalan or Harra *Terminalia chebula*.

The common grasses of Chandoli NP include Bangala *Andropogon* sp., Golden Beard Grass or Dongari *Chrysopogon fulvus*, Black Spear Grass or Tanglehead Grass *Heteropogon contortus* locally known as Kali Kusli, Buffel or Anjan Grass *Cenchrus ciliaris*, Grader Grass or Kangaroo Grass or Karad *Themeda quadrivalvis*, and Saphet Kusli *Aristida funiculata*. Insectivorous plants like *Drosera* sp. and *Utricularia* sp. are also found in this protected area.

### AVIFAUNA

This IBA site is one of the undisturbed forests of the Western Ghats Endemic Bird Area (EBA 123). Almost 245 bird species have been reported here (Bhate 2011). Ramchandra (2013) reported the occurrence of 151 species of birds in Chandoli.

Large nesting sites of Common Tern *Sterna hirundo* and River Tern *Sterna aurantia* (Near Threatened), have been seen for past many years in the Vajegaon Valley, Pali Valley of Shivasagar Reservoir in Koyna WLS, and valley of Vasant Sagar Reservoir in Chandoli NP.

### CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Red-headed Vulture	<i>Aegypius calvus</i>

### VULNERABLE

Asian Woollyneck	<i>Ciconia episcopus</i>
Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>

### NEAR THREATENED

Painted Stork	<i>Mycteria leucocephala</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Black-tailed Godwit	<i>Limosa limosa</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>

### ENDEMIC BIRD AREA 123: WESTERN GHATS

Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>
Malabar Parakeet	<i>Psittacula columbooides</i>
Malabar Grey Hornbill	<i>Ocyceros griseus</i>
Malabar Lark	<i>Galerida malabarica</i>
Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>
White-bellied Blue Flycatcher	<i>Cyornis pallipes</i>
Indian Rufous Babbler	<i>Turdoides subrufus</i>
Small Sunbird	<i>Leptocoma minima</i>
Vigor's Sunbird	<i>Aethopyga vigorsii</i>

A single Red-headed Vulture *Aegypius calvus* was recorded in 2007 (Rohan Bhate, pers. comm. 2012).

### OTHER KEY FAUNA

The mammals reported from this new IBA are Tiger *Panthera tigris*, Leopard *P. pardus*, Gaur *Bos gaurus*, Indian Wild Dog *Cyon alpinus*, Sloth Bear *Melursus*



ROHAN BHATE

A Lateritic Plateau in the monsoon covered with seasonal wild flowers



ROHAN BHATE

The Forest Eagle-Owl *Ketupa nipalensis* has been reported in Chandoli

*ursinus*, Sambar *Rusa unicolor*, Barking Deer *Muntiacus muntjak*, Indian Mouse Deer *Moschiola indica*, Indian Giant Squirrel *Ratufa indica*, Common Otter *Lutra lutra*, Indian Pangolin *Manis crassicaudata*, and Peninsular Grey Langur *Semnopithecus hector achates*.

Reptiles such as the Indian Rock Python *Python molurus*, Beddome's Keelback *Amphiesma beddomii*, Indian Chameleon *Chamaeleon zeylanicus*, Indian Monitor *Varanus bengalensis*, Deccan Banded Gecko *Geckoella deccanensis*, and Dwarf Gecko *Cnemaspis* sp. are also found. Even crocodiles seem to have a healthy population in Chandoli NP.

In a recent study, Koparde *et al.* (2014) found 53 species of dragonflies, including 43 species in the buffer zone and 33 species in the core area.

#### Development

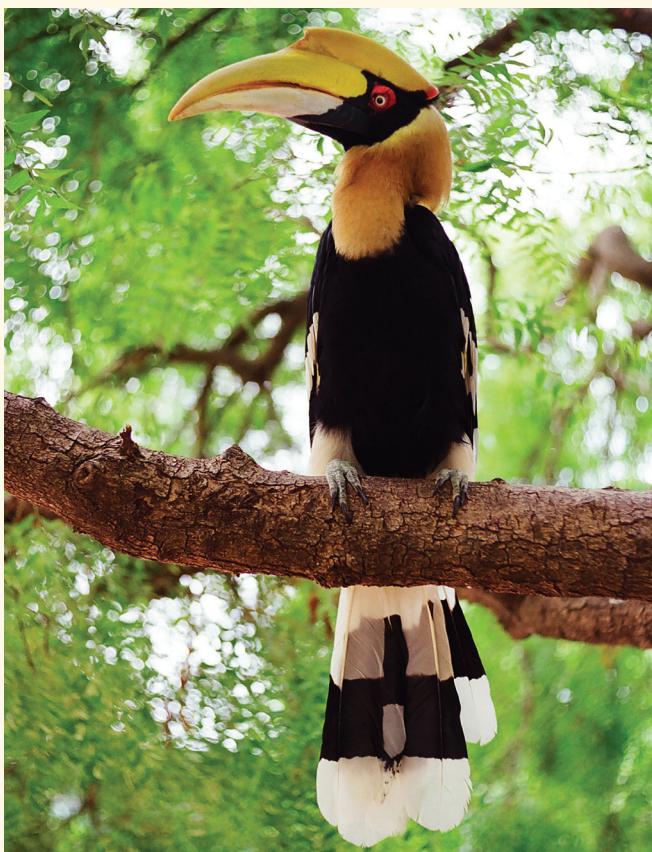
Work undertaken for habitat improvement and development in Chandoli NP includes removal of invasive species, soil and water conservation, vaccination of cattle, research, fire tracing, development of salt licks, demarcation of boundary, erection of watch towers, maintenance of nature trails, desalinating water holes, development of grasslands, and procurement of wireless equipment.

#### LAND USE

- Education
- Conservation



Tropical Dry Evergreen habitat in Chandoli National Park with the backwaters of Warna dam



RAJAT BHARGAVA

Great Pied Hornbill *Buceros bicornis* is typical of the avifauna of Chandoli National Park

### THREATS AND CONSERVATION ISSUES

The Maharashtra government plans to set up a hydro-electric project (Karadi-Bhogiv project) in the catchment area of Warna Dam, that is expected to use up 6.78 sq. km of forest land. On a positive note, nearly 7,894 people and a significant cattle population resident on 84.29 sq. km of land in 32 villages within the park have been successfully relocated to areas outside. This measure has helped to preserve and regenerate some of the vegetation in this protected area.

### KEY CONTRIBUTORS

Rohan Bhate (Shah), Nana Khamkar, Hemant Kenjale, members of Creative Nature Friends, Satara.

### KEY REFERENCES

- Bhate, R. (2011) Checklist of birds of Sahyadri Tiger Reserve, Maharashtra. Final Report. Pp. 10.
- Koparde, P., Mhaske, P., and Patwardhan, A. (2014) New records of dragonflies and damselflies (Insecta: Odonata) from the Western Ghats of Maharashtra, India. *Journal of Threatened Taxa* 6(5): 5744–5754.
- Ramchandra, A.R. (2013) Diversity and richness of bird species in newly formed habitats of Chandoli National Park in Western Ghats, Maharashtra State, India. *Biodiversity Journal* 4(1): 235–242.

# HATNUR DAM

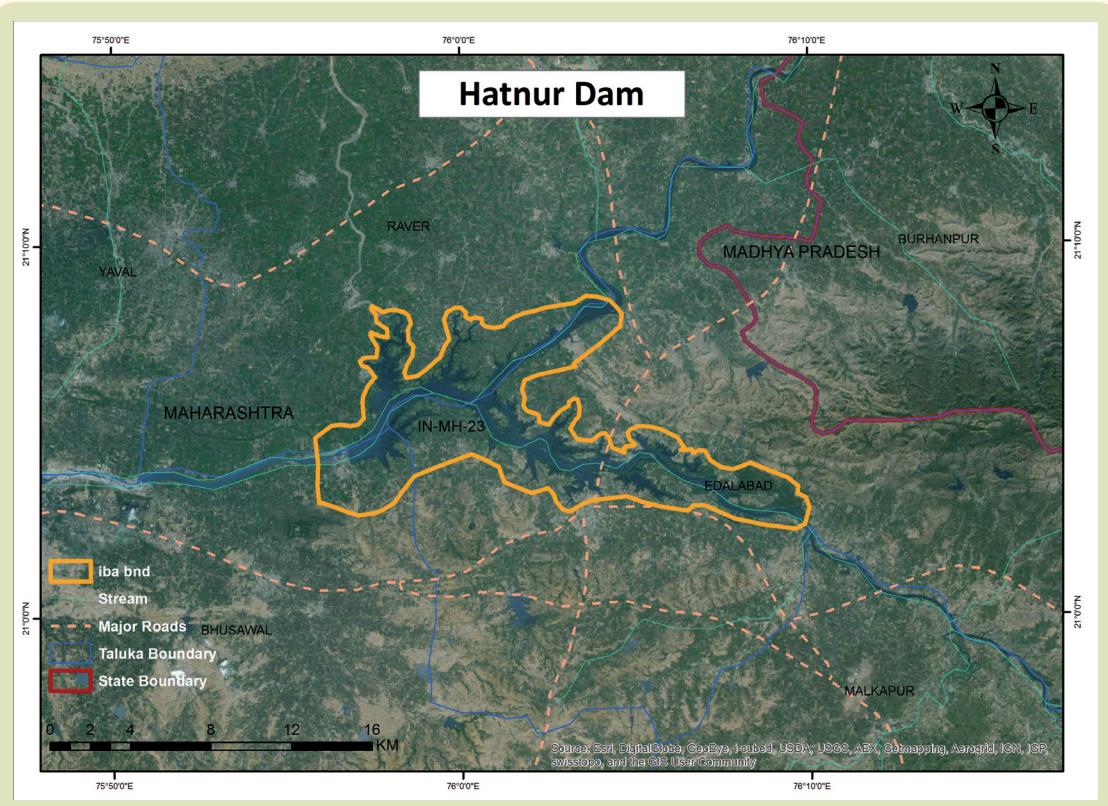
<b>IBA Site Code</b>	: IN-MH-23
<b>District</b>	: Jalgaon
<b>Coordinates</b>	: 21° 05' 37" N, 76° 01' 51" E
<b>Ownership</b>	: State, Private
<b>Area</b>	: 13,502 ha (135.02 sq. km)

<b>Altitude</b>	: 211 msl
<b>Rainfall</b>	: 680 mm
<b>Temperature</b>	: 9 °C to 46 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula
<b>Habitats</b>	: Freshwater Swamp, Tropical Dry Deciduous Forest

**IBA CRITERIA:** A1 (Threatened Species), A4i (>1% biogeographic population), A4ii (>1% global population of seabird or terrestrial species), A4iii (>20,000 waterbirds)

**PROTECTION STATUS:** Not protected.

IN-MH-23



## GENERAL DESCRIPTION

Located near Bhusawal, in Jalgaon district, Hatnur Dam has a large water storage reservoir created by the construction of a dam at the confluence of Tapti and Purna rivers. The lake is a pick-up weir constructed on the Tapti river in 1978, and filled up in 1982 to supply water for irrigation. Huge quantities of silt and organic matter carried in over the past 35 years have accumulated in the lake, due to which islands, shallow ponds, and marshlands have been created. This has resulted in a good wetland habitat for birds. Hatnur Dam and its catchment areas are surrounded

by banana, cotton, sugarcane, millet, and wheat fields. The wetland is surrounded by Dolarkheda (Kurha Vadoda) forest range.

The reservoir attracts several species of migratory birds between September and March. The water level fluctuates, depending upon usage. This suits waterfowl and waders, as most of them prefer shallow water, mudflats, and marshes. Small islands are present within the reservoir. Some small satellite lakes are also present within a radius of 25 km around the reservoir, adding to the overall importance of the region as a wetland habitat.



ANIL MAHAJAN

Congregation of Black-headed Ibis *Threskiornis melanocephalus* at Hatnur dam

## AVIFAUNA

The reservoir is an important staging and wintering ground for migratory waterfowl. At least 262 species of birds are known to occur in the region, the majority of which are migratory (Mahajan *et al.* 2013). These include over 1,500 Little Cormorant *Phalacrocorax niger*, 9,000 Common Coot *Fulica atra*, 120 Red-crested Pochard *Rhodonessa rufina*, 450 Purple Moorhen *Porphyrio porphyrio*, 350 Asian Openbill *Anastomus oscitans*, 52 Painted Stork *Mycteria leucocephala*, and 800 Small Pratincole *Glareola lactea*. Many species have been seen in numbers much above their 1% threshold level determined by Wetlands International (2006).

The Critically Endangered Long-billed Vulture *Gyps indicus* and five Near Threatened species, namely, Painted Stork *Mycteria leucocephala*, Black-headed Ibis *Threskiornis melanocephalus*, Oriental Darter *Anhinga melanogaster*, Alexandrine Parakeet *Psittacula eupatria*, and Ferruginous Duck *Aythya nyroca* are found in the Hatnur area (Mahajan *et al.* 2013b). During the waterbird count in January 2012, a total of 21,200 birds were counted, and in 2014 more than 25,000 birds were estimated here (Anil Mahajan, *pers. comm.* 2014).

During a waterbird census in January 2013, 1,594 Little Cormorant, 142 Asian Openbill, 109 Black-headed Ibis *Threskiornis melanocephalus*, 126 Glossy Ibis *Plegadis falcinellus*, 532 Lesser Whistling-duck *Dendrocygna javanica*, 377 Tufted Duck *Aythya fuligula*, 520 Red-crested Pochard, 1,010 Gadwall *Anas strepera*, two Ferruginous Duck *Aythya nyroca*, 7,153 Common Coot *Fulica atra*, and 12,400 unidentified waterbirds were seen. The total bird count in the Hatnur dam area exceeded 31,000 birds (Mahajan *et. al* 2013a).

### CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>

### VULNERABLE

Asian Woollyneck	<i>Ciconia episcopus</i>
------------------	--------------------------

### NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Great Thick-knee	<i>Esacus recurvirostris</i>
Black-tailed Godwit	<i>Limosa limosa</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>

### OTHER KEY FAUNA

At least three Tiger *Panthera tigris* are found in this area (Anil Mahajan, *pers. comm.* 2012).

Many other large and small mammals of the Satpuras are found in the forest near Hatnur Dam, including Leopard



RAJU KASAMBE

Ferruginous Duck *Aythya nyroca* was recently sighted in Hatnur Dam



ANIL MAHAJAN

Congregation of Painted Storks *Mycteria leucocephala* and Black-headed Ibis *Threskiornis melanocephalus* at Hatnur dam

*Panthera pardus*, Sambar *Cervus unicolor*, Chital *Axis axis*, Barking Deer *Muntiacus muntjak*, Wild Boar *Sus scrofa*, Sloth Bear *Melursus ursinus*, Four-horned Antelope *Tetracerus quadricornis*, Common Langur *Semnopithecus entellus*, and Bonnet Macaque *Macaca radiata*.

#### LAND USE

- Agriculture
- Aquaculture
- Nature conservation and research
- Water management

#### THREATS AND CONSERVATION ISSUES

- Fisheries
- Invasion by exotic plants
- Disturbance to birds
- Filling in of wetlands (siltation)
- Livestock grazing

Heavy siltation is filling up the reservoir gradually. The exotic *Eichhornia crassipes* and *Parthenium* sp. have

infested the area and need to be removed. Aquatic vegetation is collected for food and fodder on a large scale. Excessive fishing and grazing by domestic livestock also causes disturbance. Diesel engines, which are used along with electric pumps to draw water, cause immense pollution. The avifauna of the area is considerably disturbed because of dynamiting to increase number of gates at the dam.

#### KEY CONTRIBUTORS

Anil Mahajan, Raju Kasambe, Siddhesh Surve, Ganesh Sonar.

#### REFERENCES

Mahajan, A., Kasambe, R. and Surve, S. (2013a) Bird survey at Hatnur Dam. *Mistnet* 14(2): 4–5.  
 Mahajan, A., Jaware, S., Chaudhari, U. and Kasambe, R. (2013b) Avifauna of Hatnur Dam and its adjoining forest including Ordnance Factory, Varangaon, Distt. Jalgaon, Maharashtra. *Newsletter for Birdwatchers* 53(2): 19–28.  
 Wetlands International (2006) *Waterbird Population Estimates – Fourth Edition*. Wetlands International, Wageningen, The Netherlands. Pp. 239.

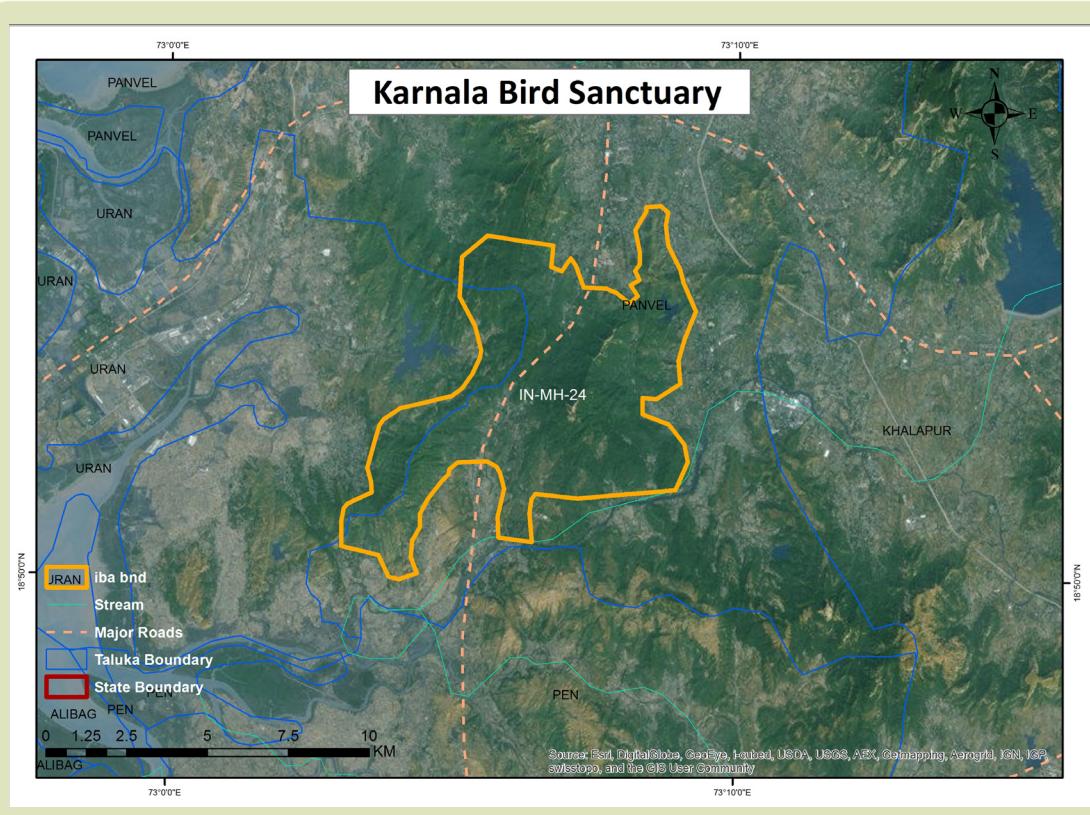
## KARNALA BIRD SANCTUARY

<b>IBA Site Code</b>	: IN-MH-24
<b>Administrative Region</b>	: Maharashtra
<b>(State)</b>	
<b>District</b>	: Raigad
<b>Coordinates</b>	: 18° 53' N and 73° 7' E
<b>Ownership</b>	: State Forest Department
<b>Area</b>	: 1,896 ha

<b>Altitude</b>	: 20 to 450 msl
<b>Rainfall</b>	: 3,884 mm (Raigad district)
<b>Temperature</b>	: 16.1° to 40.4° C
<b>Biogeographic Zone</b>	: Western Ghats
<b>Habitats</b>	: Hill Forest, Southern Dry Mix Deciduous Forest, Open Forest, Riverine Fringe Forest, Grasslands

**IBA CRITERIA:** A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), Biome 11 (Indo-Malayan Tropical Dry Zone).

**PROTECTION STATUS:** Established as Bird Sanctuary in 1968 covering 448 ha area, increased to 12.11 sq.km (or 1,211 hectares) in 1975. Adjoining area of 685 ha included in the Sanctuary in June 2015.

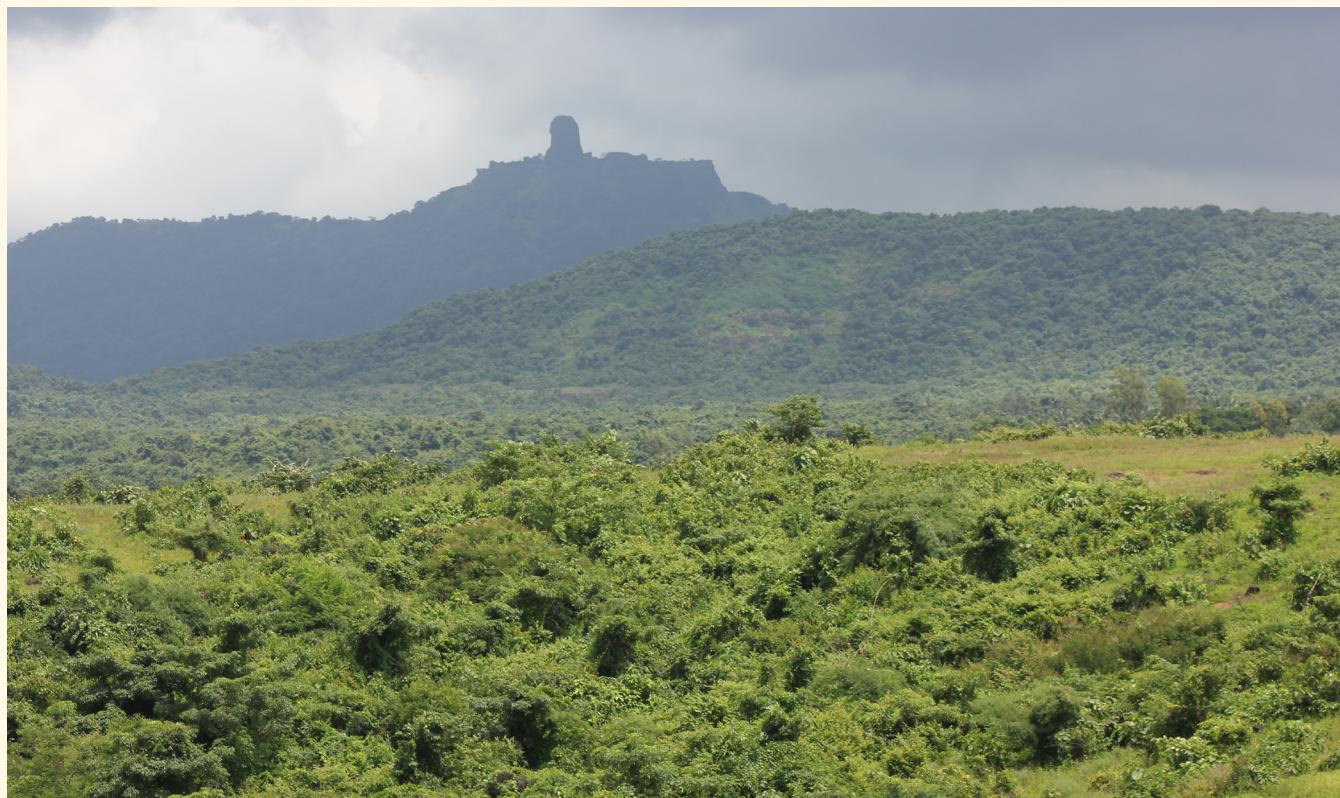


### GENERAL DESCRIPTION

Karnala Bird Sanctuary, situated in Panvel taluk of Raigad district, is about 60 km from Mumbai on the Mumbai-Goa Highway (NH-17), with an elevation range of approximately 20 m to 450 m. It was declared as a sanctuary in 1968 with an area of 4.48 sq. km. In 1975 the area was increased to 12.11 sq. km (1,211 hectares). The highway passes right through the Sanctuary (about 2.5 km of the highway falls within the Sanctuary area) dividing it into two unequal parts, the larger part with the fort falling on the east

of the highway and the smaller part on the west. Situated in the Biogeographic province of Malabar Plains Region, the Sanctuary is part of one of the spurs of the Northern Sahyadri Range in the Western Ghats. The highest point of the Sanctuary is the Karnala Fort at 450 m. The Sanctuary displays a 40% tree cover.

The habitat of Karnala Bird Sanctuary can be divided into five distinct habitat types: Hill Forest: Mostly Southern Dry Mix Deciduous are seen along the slopes of the hill, mainly composed of plant species like *Garunga pinnata*,



Karnala Fort is the highest elevation destination for trekkers and birdwatchers

IN-MH-24

PARVEEN SHAIKH

*Terminalia bellerica* and *Schleichera oleosa*; Open Forest: Teak *Tectona grandis* is found in small patches at the base of the Karnala Hill; Riverine Fringe Forest: Locally known as *nallas*, it is seen along the non-perennial streams, mainly composing of Cluster Fig *Ficus glomerata* (syn. *F. racemosa*), Jambul *Syzygium cumini*, *Pongamia pinnata*, Queen's Flowers *Lagerstroemia speciosa* and Mango *Mangifera indica*; Grassland: Isolated patches of grassland in the Sanctuary, locally known as 'Mal' and including three important grassland patches, namely *Garmal*, *Mohormal* and *Rithamal*; Waterbodies: Apart from the non-perennial streams, the park has check dam which collects rainwater and has water till the month of December.

## AVIFAUNA

A bird checklist published by the Forest Department enlists 134 species of birds (Anon. 2008) whereas the book *National Park and Sanctuaries in Maharashtra* by Pande (2005) contains 158 species. A paper by Joshi *et al.* (2013) and an abstract by Joshi and Raut (2013) mention the occurrence of 144 bird species, but these publications do not provide the full checklist of birds. The eBird website ([www.ebird.org](http://www.ebird.org)) has a checklist of 143 species of birds reported by many peer birders over the last few years in Karnala. A comprehensive checklist by Kasambe and Khan (2015) enlists 222 species of birds in the Sanctuary.

The comprehensive checklist of birds (Kasambe and Khan *in prep.*) consists of 222 species recorded from the Sanctuary

belonging to 50 families. Out of which 161 are resident species, 46 winter migrants, three breeding migrants, seven passage migrants and five are vagrant species. The list consists of 5 species listed in the IUCN threatened list and 8 Western Ghats endemics. At least 26 out of 59 species of Biome 11 (Indo-Malayan Tropical Dry Zone) are reported from here (Kasambe and Khan 2015).

Following are some of the important sighting records in Karnala: Eurasian Crag Martin *Hirundo rupestris* was reported by Sálim Ali and Humayun Abdulali (1938) on 16 February 1936. Blue-faced Malkoha *Phaenicophaeus viridirostris* (then called Green-billed Malkoha *Rhopodytes viridirostris*) was reported by Abdulali (1953) when he saw a bird at the Karnala Fort on 10 May 1953. Sangeeta Dhanuka reported sighting of Alpine Swift *Tachymarptis melba* on 4 March 2001. Malabar Grey Hornbill *Ocyceros griseus* was reported by Stairmand on February 17, 1970 (Stairmand 1970) and then by Sunjoy Monga in 2001. Ashy Minivet *Pericrocotus divaricatus*, which is a rare winter visitor to India, was first reported from Karnala on January 31, 1965 when six birds were seen, out of which one was collected and is kept in BNHS collection (Navarro 1965 a, b). The species was sighted here almost after a gap of 46 years on February 26, 2012 by avid birders Ritesh Bagul and Alok Bhave. It has been sighted by many bird watchers since then. Navarro (1965b) reported the sighting of Eurasian Blackbird *Turdus merula nigropileus*. It was reported again by Monga (2001) and then Joshi *et al.* (2013). Forest

Wagtail *Dendronanthus indicus* and Jerdon's Nightjar *Caprimulgus atripennis* were reported recently by Joshi *et al.* (2013). Black-naped Oriole *Oriolus chinensis* which is a rare winter visitor, was reported here on November 25, 1985 when 4 females or immature birds were seen (Banerjee 1987). Sunjoy Monga reported sighting of three Malabar Parakeets *Psittacula columboides* on August 22, 2001 (Prasad 2003). A Slaty-legged Crake *Rallina eurizonoides* was sighted by Asif Khan on May 4, 2014 in the forest undergrowth (Kasambe and Khan, *in prep.*). A Rufous-bellied Eagle *Lophotriorchis kienerii* was sighted by avid birder Adesh Shivkar and Santosh Gulavani here on July 6, 2014 (*pers. comm.* 2014). This is the first record of the species around Mumbai, which is mostly found in the Western Ghats south of Goa. Nilgiri Wood-pigeon *Columba elphinstonii* (Harishchandra Mhatre *pers. comm.* 2014) and Emerald Dove *Chalcophaps indica* (Raju Kasambe, *pers. obs.*) are commonly seen here. Nilesh Chandorkar (2013) has reported regular sighting of around 20 vultures and 8–9 nests in and around Phansad Wildlife Sanctuary, which is not far from Karnala by crow's flight.

## OTHER FAUNA

The brochure published by the Forest Department (Anon. 2008) mentions that 642 species of plants were found during a survey carried out by the Botanical Survey of India. The Sanctuary is also home to the Four-horned Antelope *Tetracerus quadricornis*, Wild Boar *Sus scrofa*, Jungle Cat *Felis chaus*, Indian Fox *Vulpes bengalensis*, Indian Muntjac or Barking Deer *Muntiacus muntjak*, Black-naped Hare *Lepus nigricollis*, Common Langur *Semnopithecus entellus*, Common Grey Mongoose *Herpestes edwardsii* and the endangered Leopard *Panthera pardus* as well as Common Indian Monitor *Varanus bengalensis* (Anon 2008). Besides, the Sanctuary has at least 100 species of butterflies (Raju Kasambe, *pers. obs.*).

## LAND USE

- Nature conservation
- NH-17 passes through the Sanctuary
- Tourism and recreation

## THREATS AND CONSERVATION MEASURES

Currently, the NH-17 has a two lane highway passing through the Sanctuary and it falls on the 84-km Panvel-Indapur stretch of the Mumbai-Goa Highway. There was a proposal to widen this highway into a four lane road. This proposal had already been rejected twice before.

However, the Ministry of Environment, Forests and Climate Change (MOEF&CC) cleared the project proposal in June 2015 (<http://www.dnaindia.com/india/report-green-nod-to-nh-widening-cutting-through-karnala-bird-haven-2092168> as accessed on 25 June 2015).

CRITICALLY ENDANGERED	
White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
ENDANGERED	
Egyptian Vulture	<i>Neophron percnopterus</i>
NEAR THREATENED	
Cinereous Vulture	<i>Aegypius monachus</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
ENDEMIC BIRD AREA 123: WESTERN GHATS	
Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>
Grey-fronted Green-pigeon	<i>Treron affinis</i>
Malabar Parakeet	<i>Psittacula columboides</i>
Malabar Lark	<i>Galerida malabarica</i>
Malabar Grey Hornbill	<i>Ocyceros griseus</i>
Small Sunbird	<i>Leptocoma minima</i>
Vigor's Sunbird	<i>Aethopyga vigorsii</i>
BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST	
White-cheeked Barbet	<i>Megalaima viridis</i>
Malabar Whistling-thrush	<i>Myophonus horsfieldii</i>
Indian Scimitar-babbler	<i>Pomatorhinus horsfieldii</i>
Loten's Sunbird	<i>Cinnyris lotenius</i>
BIOME 11: INDO-MALAYAN TROPICAL DRY ZONE	
White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Rain Quail	<i>Coturnix coromandelica</i>
Jungle Bush-quail	<i>Perdicula asiatica</i>
Indian Peafowl	<i>Pavo cristatus</i>
Yellow-footed Green-pigeon	<i>Treron phoenicopterus</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Indian Grey Hornbill	<i>Ocyceros birostris</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahrattensis</i>
Black-rumped Flameback	<i>Dinopium benghalense</i>
Malabar Lark	<i>Galerida malabarica</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
White-browed Bulbul	<i>Pycnonotus luteolus</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Rufous-bellied Babbler	<i>Dumetia hyperythra</i>
Jungle Babbler	<i>Turdoides striata</i>
Ashy Prinia	<i>Prinia socialis</i>
Jungle Prinia	<i>Prinia sylvatica</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Bank Myna	<i>Acridotheres ginginianus</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>

After the news of approval of road widening, news came that the Sanctuary area will be expanded from the present 1,211 hectares to 1,896 hectares. The Maharashtra Government has approved the expansion by declaring an adjoining 685 hectares of reserved forest as part of the Sanctuary (<http://timesofindia.indiatimes.com/city/mumbai/Karnala-bird-sanctuary-will-get-another-685-hectares/articleshow/47793691.cms> as accessed on 25 June 2015).

The existing two-lanes of the NH-17 already pose threats to the conservation of this Sanctuary in the form of pollution, littering of solid waste and illegal resorts. There is tremendous tourist pressure on this small Sanctuary.

The Sanctuary attracts hundreds of picnickers, especially on weekends, due to its proximity to Mumbai city. Unfortunately, visitors do not respect the tranquility of the Sanctuary. Many ruthless picnickers only add sound, plastic and other garbage to the place creating major disturbance (<http://www.sanctuaryasia.com> as accessed on 25 June 2015). This, despite the fact that the Forest Department has a team of staff which controls the visitors and ensures that they do not take plastic waste with them inside the Sanctuary area.

The invasive plant species *Lantana canara* is spreading fast and overtaking some of the forest patches. It needs to be controlled (Anon. 2008). The villagers from nearby villages depend on the forest for their requirement of fuel wood, thus exerting heavy pressure on the habitat.

There are few troops of Bonnet Macaque *Macaca radiata* in the Sanctuary which are fed by the people passing by the national highway. This has resulted in the macaques staying along the road and even attacking tourists.

The Forest Department has started a canteen inside the Sanctuary, which is managed by the locals. This will benefit in the long run as it already shows an increase in community involvement in the conservation of Karnala.

## KEY CONTRIBUTORS

Raju Kasambe, Asif Khan

## REFERENCES

Abdulali, H. (1953) The distribution of the Green-billed Malkoha (*Rhopodytes viridirostris* Jerdon). *JBNHS* 51(3): 737–738.

Ali, S. and Abdulali, H. (1938) The birds of Bombay and Salsette. Part IV. *JBNHS* 40(2): 148–173.

Ali, S. and Ripley, S.D. (1983) *Handbook of the birds of India and Pakistan*. Compact Edition. Oxford University Press, New Delhi.

Anon. (2008) Karnala Bird Sanctuary: Information Brochure with checklist of birds and plants found in the Sanctuary. Assistant Conservator of Forests, Wildlife Wing, Forest Department, Thane, Maharashtra. Pp.16.

Banerjee, D.P. (1987) Sighting of Black-napped Oriole. *JBNHS* 84(1): 209.

Chandorkar, N. (2013) Sighting of Himalayan Griffon Vulture and records of White-backed Vultures in Phansad Wildlife Sanctuary. *Mistnet* 14(2): 8.

Joshi, J., Raut, N.B., Khanolkar, C. and Kumar, P. (2013) Avifaunal distribution within different habitats of Karnala Bird

Sanctuary, Maharashtra. National Conference on Biodiversity: Status and Challenges in Conservation-'FAVEO'. Pp.34–38.

Joshi, P. and Raut, N.B. (2013) Avifaunal Diversity and Distribution in Karnala Bird Sanctuary, Panvel, Maharashtra. Paper presented at the International Conference on Indian Ornithology, Sálim Ali Centre for Ornithology and Natural History (SACON), Coimbatore.

Kasambe, R. and Khan, A. (2015) Checklist of birds of Karnala Bird Sanctuary, District Raigad, Maharashtra. *Newsletter for Birdwatchers* 55(2): 15–22.

Monga, S. (2001) Checklist of Birds of the Mumbai Region (with notes on status). Files of birds of bombay@yahoo@group.com.

Navarro, A. (1965a) The Ashy Minivet [*Pericrocotus divaricatus* (Raffles)]: an addition to the Indian avifauna. *JBNHS* 62(2): 303.

Navarro, A. (1965b) The Ashy Minivet *Pericrocotus cinereus* Lafresn: an addition to the Indian Avifauna. *Newsletter for Birdwatchers* 5(4): 1–3.

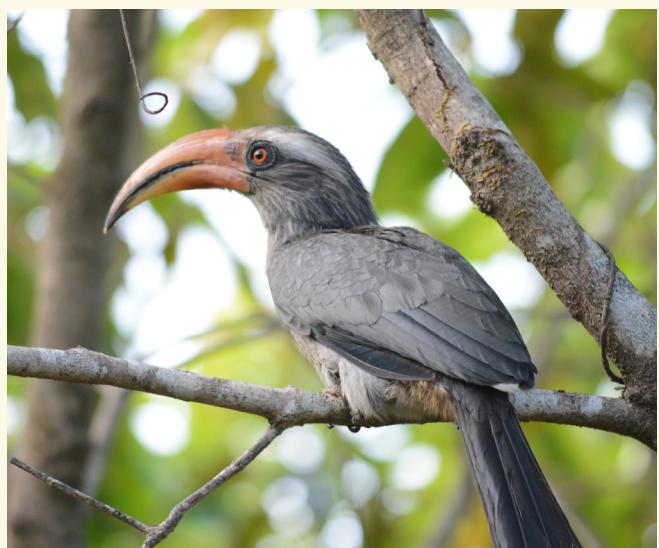
Pande, P. (2005) *National Parks and Sanctuaries in Maharashtra. Reference Guide: Individual Profile and Management Status*. Bombay Natural History Society, Bombay.

Pande, S., Tambe, S., Francis, C. and Sant, N. (2004) *Birds of Western Ghats, Kokan & Malabar (Including Birds of Goa)*. Oxford University Press. Pp.390.

Pramod, P.R., Daniels, J.R., Joshi, N.V. and Gadgil, M. (1997) Evaluating the bird communities of the Western Ghats to plan for biodiversity friendly development. *Current Science* 73(2): 156–162.

Prasad, A. (2003) Annotated checklist of the birds of Western Maharashtra. *Buceros*. ENVIS Newsletter: Avian Ecology & Inland Wetlands. 8(2&3):1–174.

Stairmand, D.A. (1970) Field excursion to Karnala and World Wildlife Fund. *Newsletter for Birdwatchers*. 10: (2) 8–10.



Malabar Grey Hornbill *Ocyceros griseus*  
has been reported from Karnala

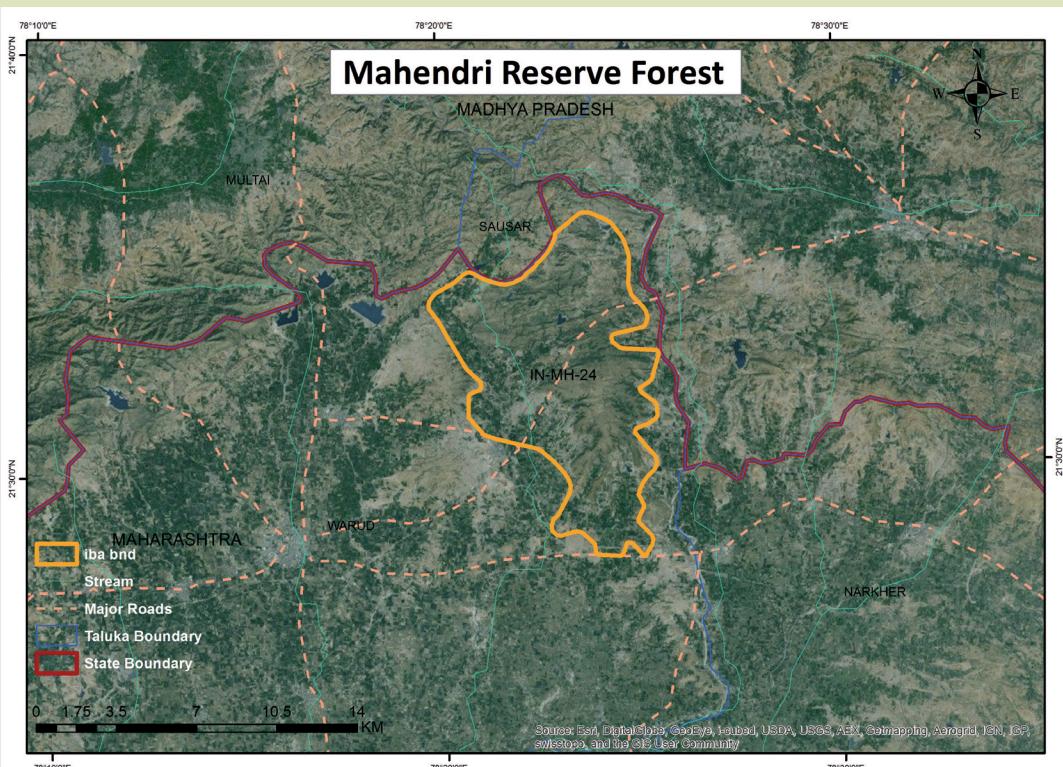
## MAHENDRI RESERVE FOREST

<b>IBA Site Code</b>	: IN-MH-25
<b>District</b>	: Amravati
<b>Coordinates</b>	: 21° 34'45" N, 78° 06' 23" E
<b>Ownership</b>	: State
<b>Area</b>	: 13,502 ha

<b>Altitude</b>	: 400–700 msl
<b>Rainfall</b>	: 1,500–2,200 mm
<b>Temperature</b>	: 6 °C to 45 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula
<b>Habitat</b>	: Tropical Dry Deciduous Forest, Tropical Grassland

**IBA CRITERIA:** A1 (Threatened Species), A2 (Secondary Area s075: Central Indian Forests),  
A3 (Biome 11: Indo-Malayan Tropical Dry Zone)

**PROTECTION STATUS:** Not officially protected.



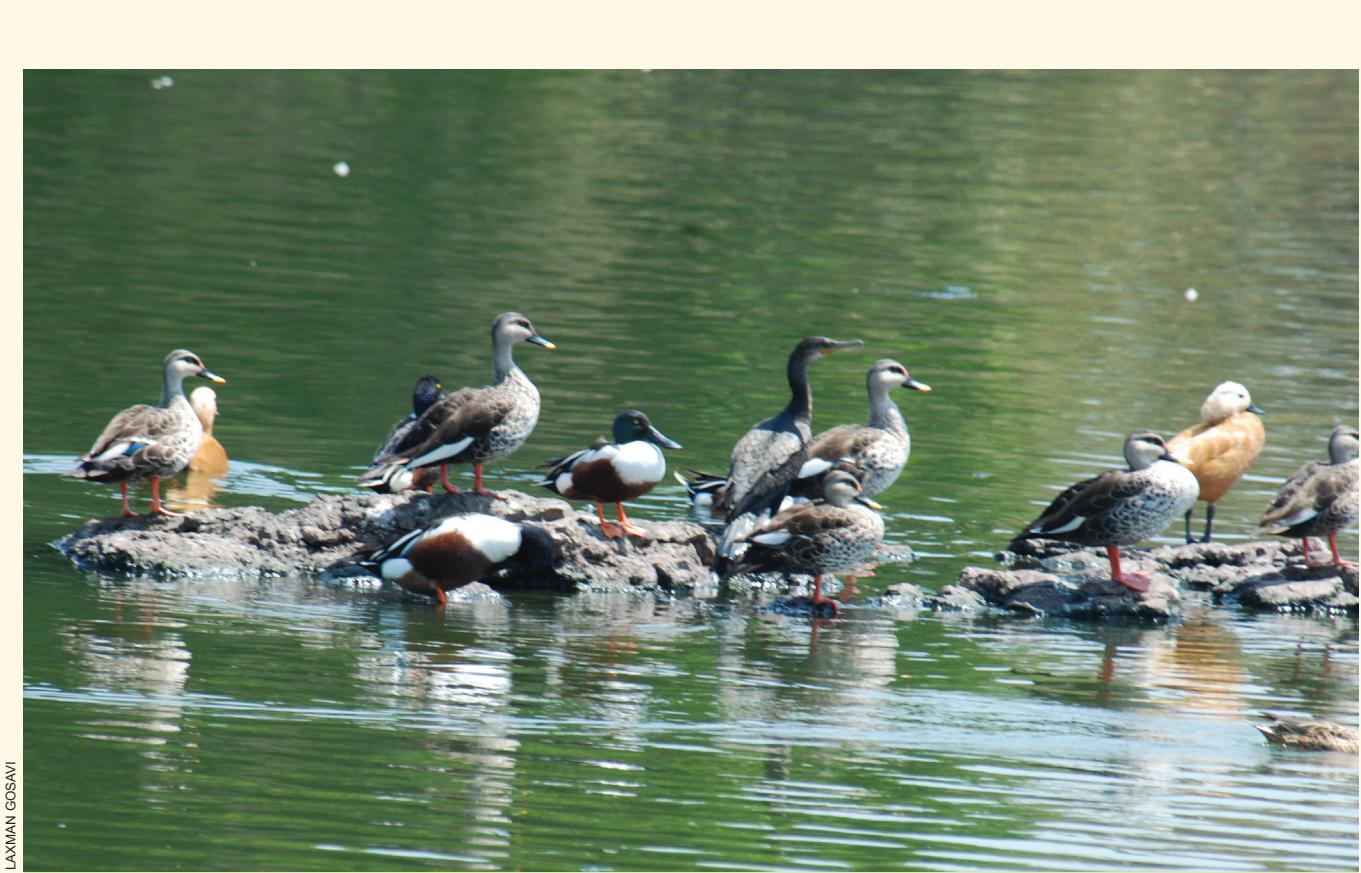
### GENERAL DESCRIPTION

Mahendri Reserve Forest is a small patch of dry deciduous forest in Warud *tehsil* of Amravati district, situated between the two tiger reserves Melghat and Pench in Maharashtra. Thus it is an important area providing a corridor to the wildlife of the two tiger reserves. It is rich in flora and fauna. Small tanks situated inside the forest, namely, Pandhari, Saturna, Pusli, Fatepur, and Shekdari provide good habitats for diverse bird species, including waterbirds. The forest beats here include Shekdari, Wai, Linga, Pimpalgarh, and Mahendri. This IBA has been proposed as a conservation reserve (Anon. 2009).

### AVIFAUNA

The forest is being visited regularly and explored since 1985 by ornithologists to document its avifauna and other wildlife. A checklist of 212 species of birds was prepared by them (Mahajan *et al.* 2012).

The Critically Endangered Forest Owlet *Heteroglaux blewitti* has been reported from Mahendri Reserve Forest (Rithe 2003). Black Stork *Ciconia nigra* is sighted regularly in Pandhari, Saturna, Pusli, and Fatepur tanks in the reserve forest (Kasambe *et al.* 2005). Black-capped Kingfisher *Halcyon pileata* has been sighted at Pandhari tank (Kasambe *et al.* 2010).



LAXMAN GOSAVI

Mahendri is the wintering ground for many species of waterbirds

Manohar Khode and P.D. Lad sighted 11 Greylag Geese *Anser anser* on October 31, 1993 at Pandhari tank. However, they were not sighted in subsequent field trips (Kasambe *et al.* 2008).

The avifauna resembles that of Melghat (Sawarkar 1987) and Pench Tiger Reserve, Madhya Pradesh (Pasha *et al.* 2004) but the diversity is less as the habitat is degraded and under severe pressure from overgrazing, illicit wood-felling, forest fires, and poaching.

Four species of vultures, namely, Long-billed Vulture *Gyps indicus*, Egyptian Vulture *Neophron percnopterus*, Red-headed Vulture *Sarcogyps calvus*, and White-rumped

#### CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Red-headed Vulture	<i>Aegypius calvus</i>
Forest Owllet	<i>Heteroglaux blewitti</i>

#### VULNERABLE

Asian Woollyneck	<i>Ciconia episcopus</i>
------------------	--------------------------

#### ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
------------------	------------------------------

#### NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Great Thick-knee	<i>Esacus recurvirostris</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>

#### SECONDARY AREA S075

Forest Owllet *Heteroglaux blewitti*

#### BIOME 11: INDO-MALAYAN TROPICAL DRY ZONE

Red-naped (Black) Ibis	<i>Pseudibis papillosa</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Painted Francolin	<i>Francolinus pictus</i>
Rain Quail	<i>Coturnix coromandelica</i>
Jungle Bush-quail	<i>Perdicula asiatica</i>
Indian Peafowl	<i>Pavo cristatus</i>
Indian Courser	<i>Cursorius coromandelicus</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Yellow-legged Green-pigeon	<i>Treron phoenicoptera</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocyceros birostris</i>
Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahrattensis</i>
Black-rumped Flameback	<i>Dinopium benghalensis</i>
White-naped Woodpecker	<i>Chrysocolaptes festivus</i>
Ashy-crowned Sparrow-lark	<i>Eremopterix griseus</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Black-headed Cuckoo-shrike	<i>Coracina melanoptera</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
White-browed Fantail	<i>Rhipidura aureola</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Jungle Babbler	<i>Turdoides striatus</i>
Ashy Prinia	<i>Prinia socialis</i>
Jungle Prinia	<i>Prinia sylvatica</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>



Tropical Dry Deciduous habitat in Mahendri Reserve Forest

Vulture *Gyps bengalensis* were regularly seen in the 1980s but have now disappeared from the area. The White-rumped Vulture was the most numerous at one time.

#### OTHER KEY FAUNA

Tiger *Panthera tigris* is reported intermittently, as the area is an important corridor for its movement. The conservation of Mahendri Reserve Forest thus gains importance as the only link between Melghat and Pench Tiger Reserves, and as a link between the forests of Maharashtra and Madhya Pradesh. Many other large and small mammals typical of central India are found in Mahendri, including Leopard *Panthera pardus*, Sambar *Cervus unicolor*, Chital *Axis axis*, Barking Deer *Muntiacus muntjak*, Wild Boar *Sus scrofa*, Sloth Bear *Melursus ursinus*, Four-horned Antelope *Tetracerus quadricornis*, Common Langur *Semnopithecus entellus*, and Bonnet Macaque *Macaca radiata*.

#### LAND USE

- Forestry
- Agriculture

#### THREATS AND CONSERVATION ISSUES

- Overgrazing
- Illicit tree-felling
- Forest fires
- Poaching

#### KEY CONTRIBUTORS

Anil Mahajan, Padmakar Lad, Vijay Ingole, Manohar Khode, Raju Kasambe.

#### KEY REFERENCES

Anon. (2009) Conservation Reserve Status proposed for Mahendri Reserve Forest. *Protected Area Update*. Vol. XV. No. 6:10–11.

Kasambe, R., Chakravarty, R., Lad, P. and Dharmadhikari, U. (2010) Sighting records of Black-capped Kingfisher (*Halcyon pileata*) in Vidarbha, Maharashtra. *Newsletter for Birdwatchers* 50 (3): 44–45.

Kasambe, R., Pimplapure, A., Thosar, G. and Khode, M. (2008) Sighting records of Greylag Goose (*Anser anser*) from Maharashtra. *Newsletter for Birdwatchers* 47(6): 94.

Kasambe, R., Wadatkar J., Khode, M. and Khode, R. (2005) Sighting records of Black Storks (*Ciconia nigra*) in Amravati District of Maharashtra. *Newsletter for Birdwatchers* 45(5): 78–80.

Mahajan, A., Lad, P., Ingole, V., Khode, M., Kasambe, R. and Wadatkar, J. (2012) Checklist of birds of Mahendri Reserve Forest, Amravati, Maharashtra. *Newsletter for Birdwatchers* 52(2): 17–23.

Pasha, M.K.S., Jayapal, R., Areendran, G., Qureshi, Q. and Sankar, K. (2004) Birds of Pench Tiger Reserve, Madhya Pradesh, Central India. *Newsletter for Ornithologists* 1 (1&2): 2–9.

Rithe, K. (2003) Saving the Forest Owlet. *Sanctuary Asia* 23(1): 30–33.

Sawarkar, V.B. (1987) Bird survey of Melghat Tiger Reserve. *Cheetal* 29: 4–27.

# PENCH TIGER RESERVE

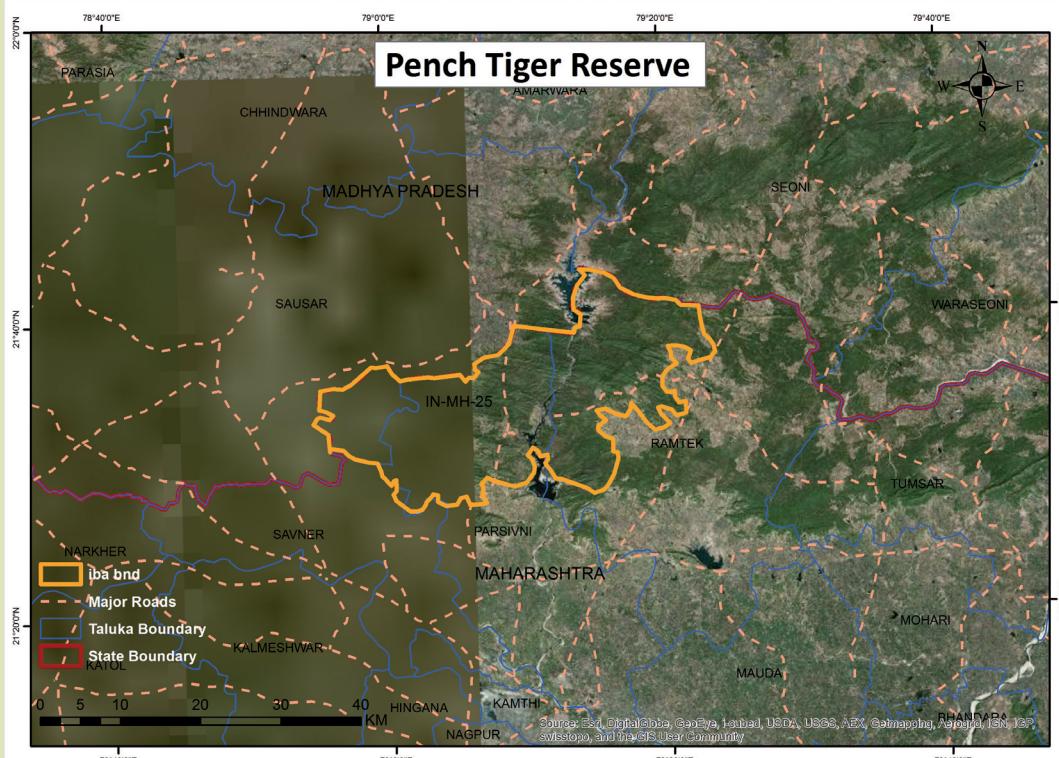
IN-MH-26

<b>IBA Site Code</b>	: IN-MH-26
<b>State</b>	: Maharashtra
<b>District</b>	: Nagpur
<b>Coordinates</b>	: 21° 29' 42" N, 79° 04' 24" E
<b>Ownership</b>	: State
<b>Area</b>	: 25,726 ha

<b>Altitude</b>	: 670 msl
<b>Rainfall</b>	: 1,250 mm
<b>Temperature</b>	: 13.9 °C to 43 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula
<b>Habitats</b>	: Tropical Dry Deciduous Forest, Tropical Grassland

**IBA CRITERIA:** A1 (Threatened species), A2 (Secondary Area s075: Central Indian Forests),  
A3 (Biome 11: Indo-Malayan Tropical Dry Zone)

**PROTECTION STATUS:** National Park, declared 1975; Tiger Reserve, declared February, 1999.



## GENERAL DESCRIPTION

Pench Tiger Reserve extends over an area of 257 sq. km in the southern reaches of the Satpuda Hills, along the northern boundary of Nagpur district. It is c. 75 km from Nagpur city. The reserve is named from the Pench river, which divides it into east and west blocks. The forest is Dry Deciduous, with a few evergreen species along the streams and river. Pench Hydroelectric Project has a large reservoir, Totladoh, with c. 77 sq. km waterspread, which provides habitats for waterbirds. Rich in biodiversity, its terrain defined by hills, valleys, and occasional precipitous slopes, Pench is an important ecosystem supporting an abundance of flora and fauna, including a rich variety of aquatic life (Pasha *et al.* 2004).

The poet Kalidasa wrote about the scenic charm of this area in his epics *Meghadootam* and *Abhigyan Shakuntalam*. R.A. Sterndale's "Camp in the Satpura Hills" draws a vivid picture of this idyllic paradise, as does James Forsyth's "Highlands of Central India". Pench National Park is four different forest regions in one, an extravagance of trees, shrubs, grasses, climbers, and herbs, with Teak *Tectona grandis* being the most prominent of the tree species.

## AVIFAUNA

A checklist of the birds of Pench, published by the Forest Department (Anon. 2000), lists 164 species of birds. Pasha *et al.* (2004) reported 268 species from the portion



AK RAJU

Malabar Pied Hornbill *Anthracoceros coronatus* is often seen in Pench Tiger Reserve

of Pench Tiger Reserve in Madhya Pradesh, including the threatened Ferruginous Duck *Aythya nyroca*, Malabar Pied Hornbill *Anthracoceros coronatus*, Grey-headed Fish-eagle *Ichthyophaga ichthyaetus*, Pallas' Fish-eagle *Haliaeetus leucoryphus*, White-rumped Vulture *Gyps bengalensis*, Long-billed Vulture *Gyps indicus*, Red-headed Vulture *Aegypius calvus*, Cinereous Vulture *Aegypius monachus*, Egyptian Vulture *Neophron percnopterus*, Oriental Darter *Anhinga melanogaster*, Black-headed Ibis *Threskiornis melanocephalus*, Painted Stork *Mycteria leucocephala*, Black-necked Stork *Ephippiorhynchus asiaticus*, and River Tern *Sterna aurantia*. During a survey between 1996 and 2000, Red-headed Vulture was found occasionally in Pench (Rahmani 2012).

G. Thosar & A. Pimplapure (*pers. comm.* 2012) saw 10 White-rumped Vulture and seven nests on March 18, 2012 in Pench. Other species of interest are Indian Pitta *Pitta brachyura*, Osprey *Pandion haliaetus*, Grey-headed Fish-eagle *Ichthyophaga ichthyaetus*, White-eyed Buzzard *Butastur teesa*, Black Stork *Ciconia nigra*, four threatened vulture species, and Yellow-footed Green-pigeon *Treron phoenicopterus*, which is the State Bird of Maharashtra.

## OTHER KEY FAUNA

Pench is home to 33 species of mammals, 50 species of fish, 10 species of amphibians, 30 species of reptiles, and a wide variety of insect life. Tiger *Panthera tigris*, Leopard *P. pardus*, Caracal *Caracal caracal*, Gaur *Bos gaurus*, Sambar *Rucervus unicolor*, Chital *Axis axis*, Barking Deer *Muntiacus muntjak*, Wild Boar *Sus scrofa*, Sloth Bear *Melursus ursinus*, Four-horned Antelope *Tetracerus quadricornis*, Indian Giant

## CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Indian Vulture	<i>Gyps indicus</i>
Red-headed Vulture	<i>Aegypius calvus</i>

## ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
Asian Woollyneck	<i>Ciconia episcopus</i>

## VULNERABLE

Greater Spotted Eagle	<i>Clanga clanga</i>
-----------------------	----------------------

## NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaetus</i>
River Lapwing	<i>Vanellus duvaucelii</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

## BIOME 11: INDO-MALAYAN TROPICAL DRY ZONE

Red-naped (Black) Ibis	<i>Pseudibis papillosa</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Painted Francolin	<i>Francolinus pictus</i>
Rain Quail	<i>Coturnix coromandelica</i>
Jungle Bush-quail	<i>Perdicula asiatica</i>
Indian Peafowl	<i>Pavo cristatus</i>
Indian Courser	<i>Cursorius coromandelicus</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Yellow-footed Green-pigeon	<i>Treron phoenicopterus</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocyceros birostris</i>
Yellow-crowned Woodpecker	<i>Dendrocopos (= Leiopicus) mahrattensis</i>
Black-rumped Flameback	<i>Dinopium benghalense</i>
White-naped Woodpecker	<i>Chrysocolaptes festivus</i>
Ashy-crowned Sparrow-lark	<i>Eremopterix griseus</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Black-headed Cuckooshrike	<i>Coracina melanoptera</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
White-browed Fantail	<i>Rhipidura aureola</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Jungle Babbler	<i>Turdoides striatus</i>
Ashy Prinia	<i>Prinia socialis</i>
Jungle Prinia	<i>Prinia sylvatica</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>

Squirrel *Ratufa indica*, Common Langur *Semnopithecus entellus*, Bonnet Macaque *Macaca radiata*, Indian Pangolin *Manis crassicaudata* (Thosre 2014), Honey Badger or Ratel *Mellivora capensis*, Indian Chevrotain or Indian Mouse Deer *Moschiola indica*, and others are found here.

Important tree species include Teak *Tectona grandis*, Ain *Terminalia crenulata*, Bamboo *Bambusa arundinacea*, Haldu *Haldina cordifolia*, Karu *Sterculia urens*, Arjun *Terminalia arjuna*, Tendu *Diospyros melanoxylon*, Charoli *Buchanania lanza*, and Mahua *Madhuca indica*.



ADITYA JOSHI

Tropical Dry Deciduous Forest habitat of Pench Tiger Reserve

## CONSERVATION ISSUES

The following account is based on the website <<http://projecttiger.nic.in/penchmaha.htm>> accessed on August 1, 2012.

**Human population:** There is only one village named Phuljhari inside the reserve, whereas nine villages are situated on the periphery. Thus, c. 3,700 people from these villages are entirely dependent on the reserve for their daily needs of firewood and small timber.

**Livestock grazing:** The cattle population of nine villages around and one village inside the reserve is over 4,000, which is solely dependent on Pench for grazing. Domestic cattle from the villages Phuljhari, Sillari, Pipariya, Totladoh, Ghatpendhri, Narhar, and Banera are more or less dependent on this Reserve.

**Encroachment:** There is some encroachment in the protected area by villagers of Phuljhari and Ghatpendhri. There are illegal occupants in the temporary structures of the Irrigation Department at Totladoh.

**Forest Fire:** A few incidents are reported every year.

**Poaching of fauna and flora:** Some cases of poaching of fauna and illegal extraction of flora have been detected.

**Illegal Fishing:** Though there is great pressure of illegal fishing in Totladoh Reservoir, it is controlled by round-the-clock patrolling and vigilance.

## REFERENCES

- Anon. (2000): Checklist of Birds of Pench National Park. Published by Deputy Conservator of Forests (Wildlife), Nagpur, Maharashtra. Pp. 14.
- Pasha, M.K.S., Jaypal, R., Areendran, G., Qureshi, Q., and Sankar, K. (2004) Birds of Pench Tiger Reserve, Madhya Pradesh, Central India. *Newsletter for Ornithologists* 1(1&2): 2–9.
- Rahmani, A.R. (2012) *Threatened Birds of India – Their Conservation Requirements*. IBCN, BNHS, RSPB and BirdLife International. Oxford University Press. Pp. xvi + 864.
- Thosre, P. (2014) *The Wild Mammals of Maharashtra*. Published by Mrs. Deepti Thosre. Pp.100.

## PHANSAD WILDLIFE SANCTUARY

<b>IBA Site Code</b>	: IN-MH-27
<b>State</b>	: Maharashtra
<b>District</b>	: Raigad
<b>Coordinates</b>	: 18° 20' 05" N, 72° 54' 20" E
<b>Ownership</b>	: State
<b>Area</b>	: 5,271 ha

<b>Altitude</b>	: 20–320 msl
<b>Rainfall</b>	: 2,162–3,469 mm
<b>Temperature</b>	: 11 °C to 40 °C
<b>Biogeographic Zone</b>	: Western Coast, Western Ghats
<b>Habitat</b>	: Tropical Dry Deciduous Forest, Tropical Dry Evergreen Forest

**IBA CRITERIA:** A1 (Threatened species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome 10: Indian Peninsula Tropical Moist Forest; Biome 11: Indo-Malayan Tropical Dry Zone)

**PROTECTION STATUS:** Wildlife Sanctuary, established February 25, 1986.



### GENERAL DESCRIPTION

Phansad Wildlife Sanctuary is spread across 52.71 sq. km. It is located in the Murud and Roha talukas of Raigad district in Maharashtra, c. 152 km from Mumbai. The Murud-Roha road passes through the sanctuary. The forests of this protected area were a private hunting reserve of the Siddi Nawab of Janjira till 1949 (Pande 2005).

### AVIFAUNA

A recent survey carried out by BNHS recorded 280 species of birds in Phansad WLS (Apte *et al.* 2011). Threatened species reported during the BNHS survey are the Endangered Black-bellied Tern *Sterna acuticauda*,

Vulnerable Greater Spotted-eagle *Aquila clanga*, Nilgiri Wood-pigeon *Columba elphinstonii*, and Great Knot *Calidris tenuirostris* are also seen regularly. Kasambe *et al.* (2014) has mentioned that Great Knot is a regular winter visitor at Akshi Beach near Phansad, in small numbers. Nilgiri Wood-pigeon is a rare resident in Phansad WLS, where it is mostly seen in Chikhalgan, Phansadgan, and Savratgan areas (Nikhil Bhopale, *pers. comm.* 2012).

Nilesh Chandorkar (2013) has reported regular sighting of around 20 White-backed Vultures *Gyps bengalensis* and 8–9 nests in and around Phansad Wildlife Sanctuary. He also reported sighting of Himalayan Griffon Vulture *Gyps himalayensis*.

PRAVIN KAWALE



Blue-and-white Flycatcher *Cyanoptila cyanomelana* was sighted at Alibag, the first record of the species in India

However, there are no recent sight records of Indian Vulture *Gyps indicus*. Near Threatened species such as Black-headed Ibis *Threskiornis melanocephalus*, Malabar Pied Hornbill *Anthracoceros coronatus*, Black-tailed Godwit *Limosa limosa*, and Eurasian Curlew *Numenius arquata* are regularly seen.

#### CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>

#### ENDANGERED

Black-bellied Tern	<i>Sterna acuticauda</i>
--------------------	--------------------------

#### VULNERABLE

Greater Spotted Eagle	<i>Clanga clanga</i>
Great Knot	<i>Calidris tenuirostris</i>
Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>

#### NEAR THREATENED

Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

#### ENDEMIC BIRD AREA 123: WESTERN GHATS

Nilgiri Wood-pigeon	<i>Columba elphinstonii</i>
Grey-fronted Green-pigeon	<i>Treron affinis</i>
Malabar Parakeet	<i>Psittacula columbooides</i>
Malabar Grey Hornbill	<i>Ocypterus griseus</i>
Malabar Lark	<i>Galerida malabarica</i>
Malabar Woodshrike	<i>Tephrodornis sylvicola</i>
White-bellied Blue Flycatcher	<i>Cyornis pallipes</i>
Indian Rufous Babbler	<i>Turdoides subrufula</i>
Nilgiri Flowerpecker	<i>Dicaeum concolor</i>
Small Sunbird	<i>Leptocoma minima</i>
Vigor's Sunbird	<i>Aethopyga vigorsii</i>

#### BIOME 10: INDIAN PENINSULA TROPICAL MOIST FOREST

Malabar Trogan	<i>Harpactes fasciatus</i>
White-cheeked Barbet	<i>Megalaima viridis</i>
Malabar Whistling-thrush	<i>Myophonus horsfieldii</i>
Indian Scimitar-babbler	<i>Pomatorhinus horsfieldii</i>
Loten's Sunbird	<i>Cinnyris lotenii</i>



RAJU KASAMBE

A Jatayu Festival was organised by Srushtidnyan, an IBCN partner organisation at Phansad

## THREATS

- Illicit felling of trees
- Fuel wood collection
- Extensive cattle grazing
- Man-animal conflicts

Encroachment, poaching of wild animals, and illicit tree felling plagues this sanctuary. Certain areas are still being used as a summer resort by the descendants of the Nawab. There are also some private and *dalli* plots within the sanctuary (Pande 2005).

## KEY CONTRIBUTORS

Vaibhav Deshmukh, Prashant Shinde, Rahul Khot, Nikhil Bhopale.

## KEY REFERENCES

Apte, D., Prabhu, S., Bhave, V., Khot, R., Bajaru, S., Kulkarni, H., Gaikwad, K., and Bhopale, N. (2011) Rapid biodiversity assessment for Welspun Maxsteel at Salav, District Raigad,

Maharashtra. Final Report and Wildlife Conservation Plan (October 2010–January 2011). BNHS, Mumbai. Pp. 70 + 40.

Bhopale, N. and Athavale, S. (2009) First record of the Colour Sergeant *Athyma nefte* in Phansad Wildlife Sanctuary in Raigad district, Maharashtra, India. *JBNHS* 106(1): 117–118.

Chandorkar, N. (2013) Sighting of Himalayan Griffon Vulture and records of White-backed Vultures in Phansad Wildlife Sanctuary. *Mistnet* 14(2): 8.

Kasambe, R., Damle, P., and Surve, S. (2014) Sight records of Great Knot in coastal Maharashtra. *Mistnet* 15(1): 17–18.

Kawale, P. (2013) First record of the Blue-and-white Flycatcher *Cyanoptila cyanomelana* in India. *JBNHS* 110: (1) 75–76.

Nikhil, B. and Malya, K. (2009) Sighting of the Lesser False Vampire Bat *Megaderma spasma* in Phansad Wildlife Sanctuary, district Raigad, Maharashtra, India. *Small Mammal Mail* 1(2): 31.

Pande, P. (2005) *National Parks and Sanctuaries in Maharashtra. Reference Guide: Individual Profile and Management Status*. Bombay Natural History Society, Mumbai.

Thosre, P. (2014) *The Wild Mammals of Maharashtra*. Published by Mrs. Deepti Thosre. Pp. 100.

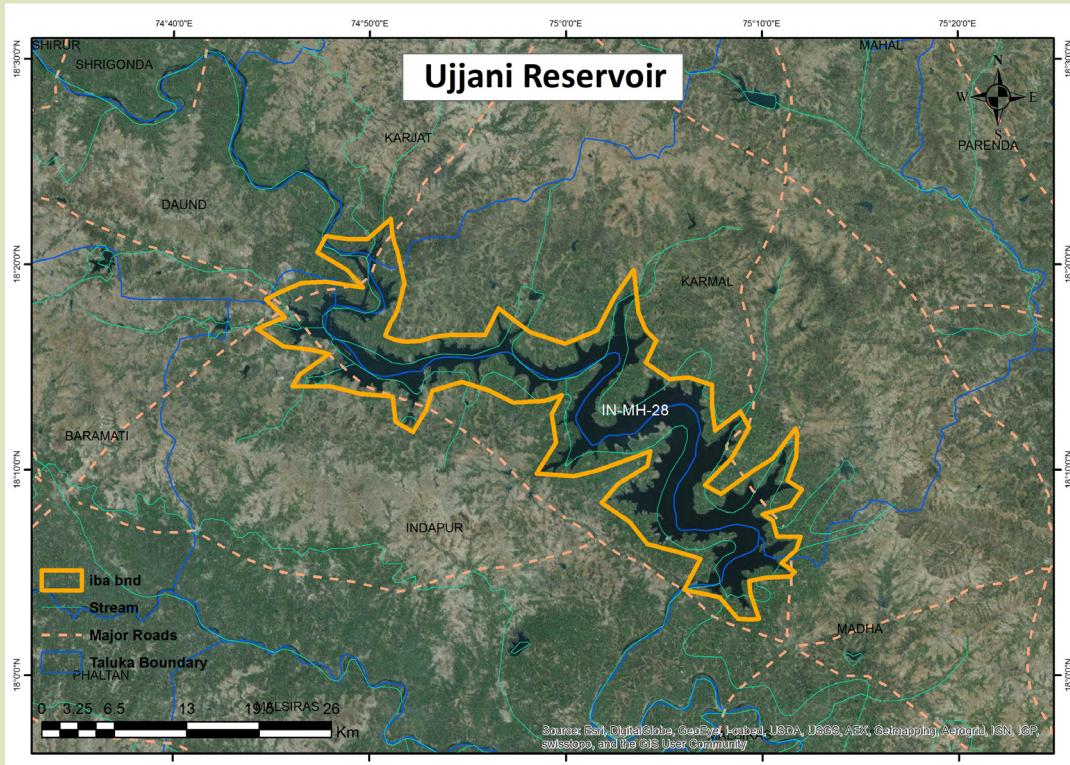
# UJJANI RESERVOIR

<b>IBA Site Code</b>	: IN-MH-28
<b>District</b>	: Pune and Solapur
<b>Coordinates</b>	: 18° 04' 26" N, 75° 07' 12" E
<b>Ownership</b>	: State, Private
<b>Area</b>	: 35,700 ha

<b>Altitude</b>	: 600 msl
<b>Rainfall</b>	: 600 mm
<b>Temperature</b>	: 10 °C to 42 °C
<b>Biogeographic Zone</b>	: Deccan Peninsula
<b>Habitat</b>	: Freshwater reservoir

**IBA CRITERIA:** A1 (Threatened species), A4i (>1% biogeographic population), A4iii (>20,000 waterbirds)

**PROTECTION STATUS:** Not officially protected. The Reservoir belongs to Irrigation Department.



## GENERAL DESCRIPTION

Ujjani Dam, an irrigation project on the Bhima river in Solapur district, was constructed nearly 25 years ago. It is located on the border of Pune and Solapur districts, near Bhigwan in Pune district. Before the dam was constructed, the area consisted of semi-arid marginal agricultural tracts and wastelands on the banks of the River Bhima. A small number of local and migratory aquatic birds used to be seen in patches along the river. Today this pattern has changed and now the backwaters of Ujjani Dam at Bhigwan constitute a highly complex wetland ecosystem (Bharucha & Gogte 1990). The shallow areas of the backwaters, particularly when the water is receding, attract large numbers of ducks and waders. The reservoir also has large expanses of shallow

water as much of the inundated land is in the plains.

Ujjani has been identified as a potential Ramsar site (Islam & Rahmani 2008) due to its importance for bird conservation.

## AVIFAUNA

Bharucha & Gogte (1990) recorded 160 species of birds from Ujjani reservoir and the surrounding areas. Of these, almost 50% were waterbirds. Notable species were Painted Stork *Mycteria leucocephala*, Black-headed Ibis *Threskiornis melanocephalus*, Eurasian Spoonbill *Platalea leucorodia*, Greater Flamingo *Phoenicopterus roseus*, Lesser Flamingo *Phoeniconaias minor*, Lesser Spotted Eagle *Aquila hastata*, Grey-headed Fish-eagle *Ichthyophaga ichthyaetus*, Common

IN-MH-28



SUJIT NARWADE

Ujjani supports many bird species, including the Asian Openbill *Anastomus oscitans*

Crane *Grus grus*, Demoiselle Crane *Grus virgo*, Asian Openbill *Anastomus oscitans*, 14 species of ducks, and 27 species of waders of Charadriiformes. The numerous islands which come up as the water is used up for irrigation are utilised by River Tern *Sterna aurantia*, Little Tern *Sterna albifrons*, Little Ringed Plover *Charadrius dubius*, and pratincoles *Glareola* spp. for nesting. They recorded 100, 250, nil, and 120 nests of River Tern *Sterna aurantia* during a four year period, i.e. 1986–1989. During three years from 1987 to 1989, they saw 24, 78, and 13 Ferruginous Duck *Aythya nyroca* respectively.

A single Spot-billed Pelican *Pelecanus philippensis* was sighted at Bhigwan (backwaters of Ujjani reservoir) on January 27, 2013 by Adesh Shivkar and subsequently by Abhijit Juvekar on February 3, 2013 (Rahmani *et al.* 2014).

### CONSERVATION ISSUES

At present, the entire waterbody is under the jurisdiction of the Irrigation Department. The wetland and some parts of the backwaters should be declared as a sanctuary (Bharucha & Gogte 1990).

In 2013, the Forest Department had announced six sites were identified to be declared as Ramsar Sites. They are Ujjani Reservoir (Pune district), Jaikwadi Bird Sanctuary (Aurangabad district), Navegaon Bandh Reservoir (Gondia district), Nandur Madhmeshwar Wildlife Sanctuary (Nashik district), Sewri Creek (Mumbai district), and Lonar

### VULNERABLE

Asian Woollyneck	<i>Ciconia episcopus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>

### NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Lesser Flamingo	<i>Phoeniconaias minor</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaetus</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Spot-billed Pelican	<i>Pelecanus philippensis</i>
River Tern	<i>Sterna aurantia</i>

Crater Wildlife Sanctuary (Buldhana district) (<http://www.downtoearth.org.in/news/maharashtra-to-propose-five-wetland-sites-for-recognition-as-ramsar-sites-40159> as accessed on 05 September 2015). However, nothing has happened till date.

As the water recedes, the exposed land is leased by the Irrigation Department for farming. The villagers were compensated for their land when it was acquired for the reservoir, so some land on the edge could be constituted into a ‘core zone’ where human disturbance is minimized, to enable the birds to breed successfully. Grazing by livestock greatly disturbs the tern nesting colonies. This needs to be stopped at once, particularly on the exposed islands.

Fishing should be regulated. Islands where the birds nest should be out of bounds for drying of nets and other



AVINASH BHAGAT

Ujjani dam is visited by many birdwatchers due to its easy access from Pune

activities (Bharucha & Gogte 1990). There should be control on the mesh-size of fishing nets. Water Hyacinth should be eradicated and *Paspalum* should be controlled.

#### KEY CONTRIBUTORS

B. Raha, Erach K. Bharucha, Girish Jathar, Vivek Kulkarni, Isaac Kehimkar.

#### REFERENCES:

Bharucha, E.K. and Gogte, P.P. (1990): Avian profile of a man-modified aquatic ecosystem in the backwaters of the Ujjani Dam. *JBNHS* 87: 73–90.

Islam, M.Z. and Rahmani, A.R. (2008) *Potential and Existing Ramsar Sites in India*. Indian Bird Conservation Network, Bombay Natural History Society, BirdLife International, and Royal Society for the Protection of Birds, UK. Oxford University Press. Pp. 592.

Rahmani, A.R., Kasambe, R., Narwade, S., Patil, P. & Khan, N.I. (2014) *Threatened Birds of Maharashtra*. Indian Bird Conservation Network, Bombay Natural History Society, Royal Society for the Protection of Birds, and BirdLife International. Oxford University Press. Pp. xii + 224.

Wetlands International (2006) *Waterbirds Population Estimates: Fourth Edition*. Wetlands International, Wageningen, The Netherlands.